



Meditsiini UPDATE 2019 ortopeedia

Aare Märtson, prof.

Tartu Ülikool

Tartu Ülikooli Kliinikum

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Swissôtel Tallinn konverentsikeskus

Ortopeedia

Ortopeedia on kirurgiline eriala, mis on seotud skeletisüsteemi kaasasündinud ja omandatud haiguste, väärarengute ja funktsionaalsete probleemide (traumaatiliste või mittetraumaatiliste) anamneesi, uurimise, kindlakstegemise, ärahoidmise, ravi ja rehabilitatsiooniga.

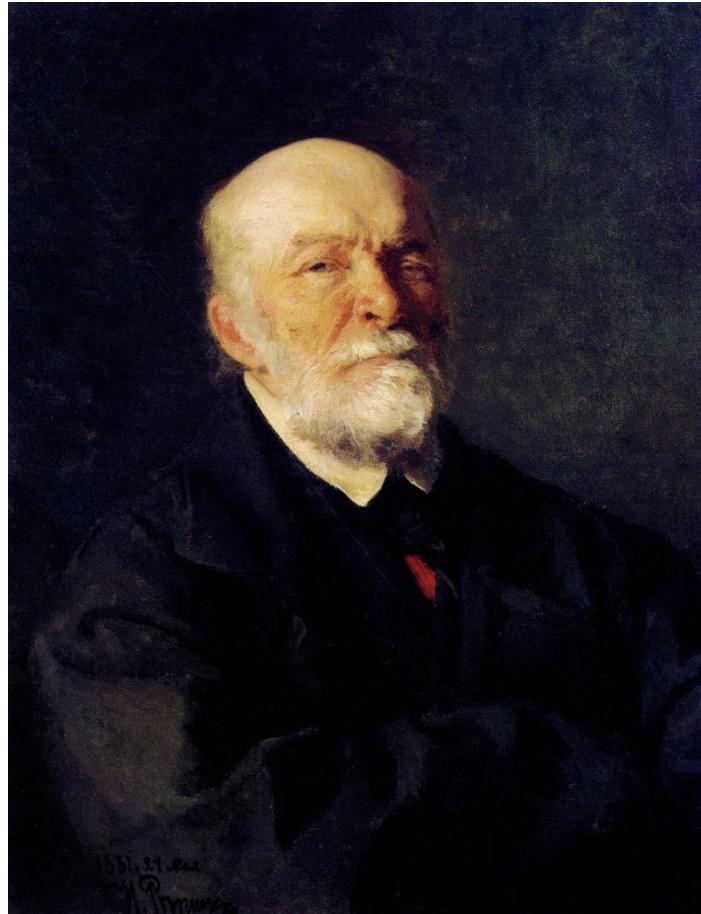
"ortopeedia" kreeka sõnad "korras" või "sirge" ("orthos") ja "laps" ("paidion"), 1741, Nicholas Andry oli 81a., "*Ortopeedia: laste deformatsioonide korrigeerimise ja ärahoidmise kunst*"



Sandro Botticelli (1445-1510). La Primavera (Kevad). 1477-78.

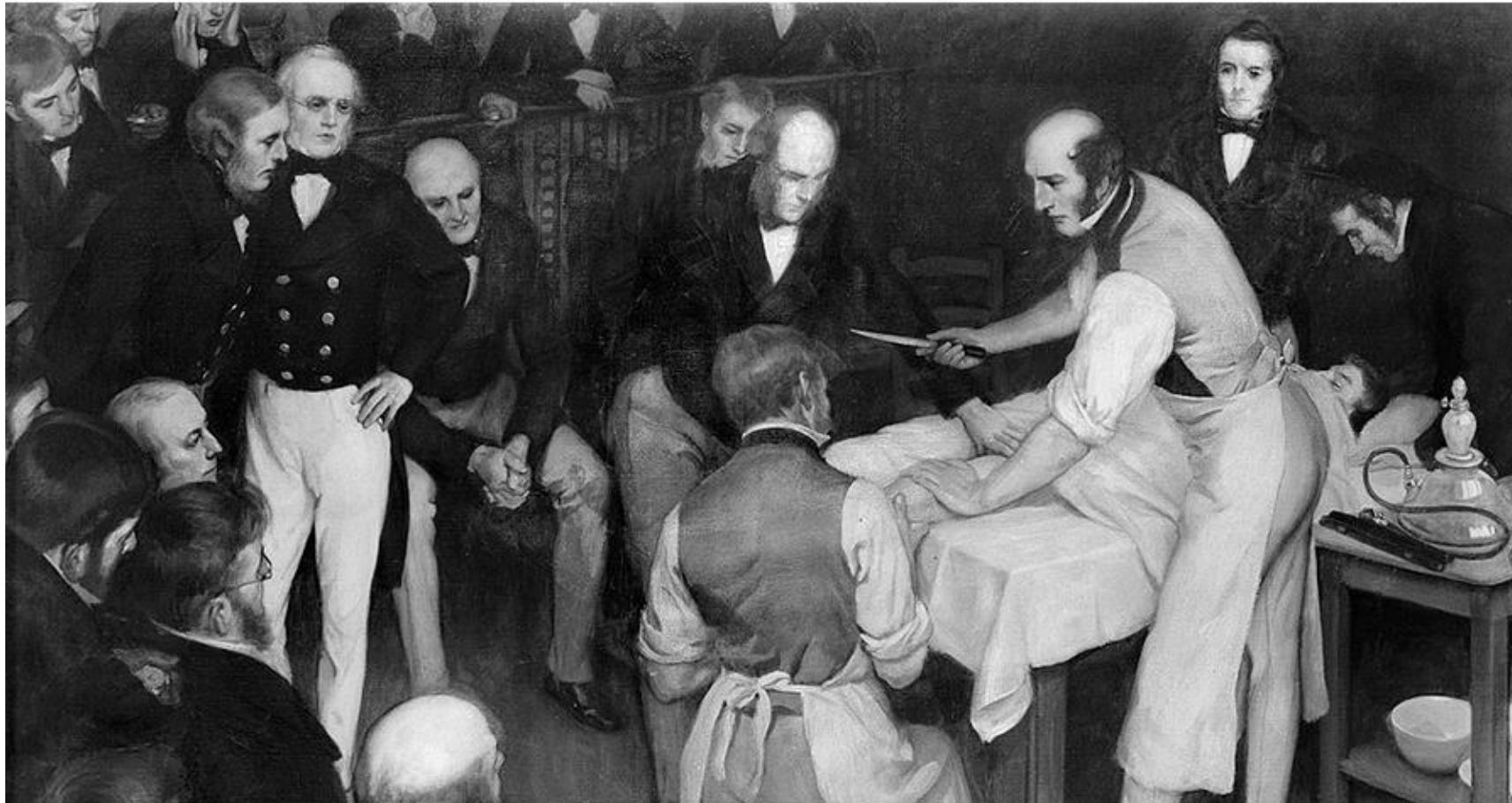


Nikolai Pirogovi (1810-1881) portree, Ilja Repin 1881



- TÜ lõpetamine 1828
- PhD 1832
- Kirurgia professor TÜ-s
1836-1840

Robert Liston pealtvaatajate ees jalga amputeerimas



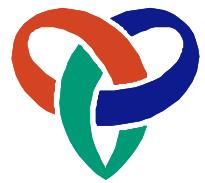
Robert Liston (1794–1847)

Robert Liston 1842

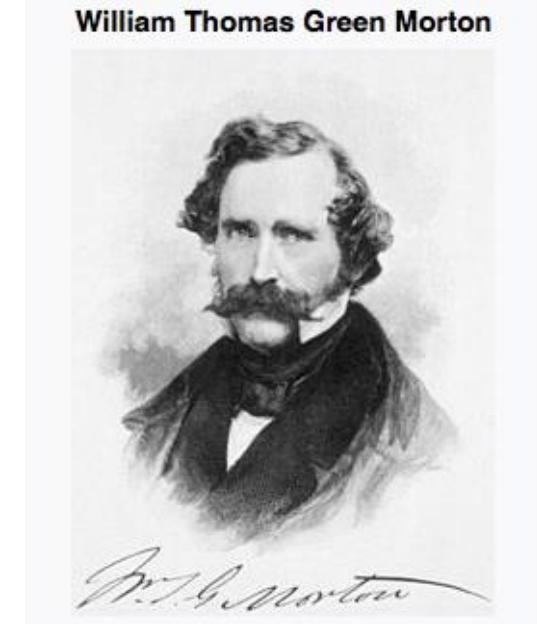


- Tuntud kui West-Endi kiireim noamees
- Saavutanud 300% suremuse

Mortoni eeternarkoosi demonstratsioon 16.10.1846

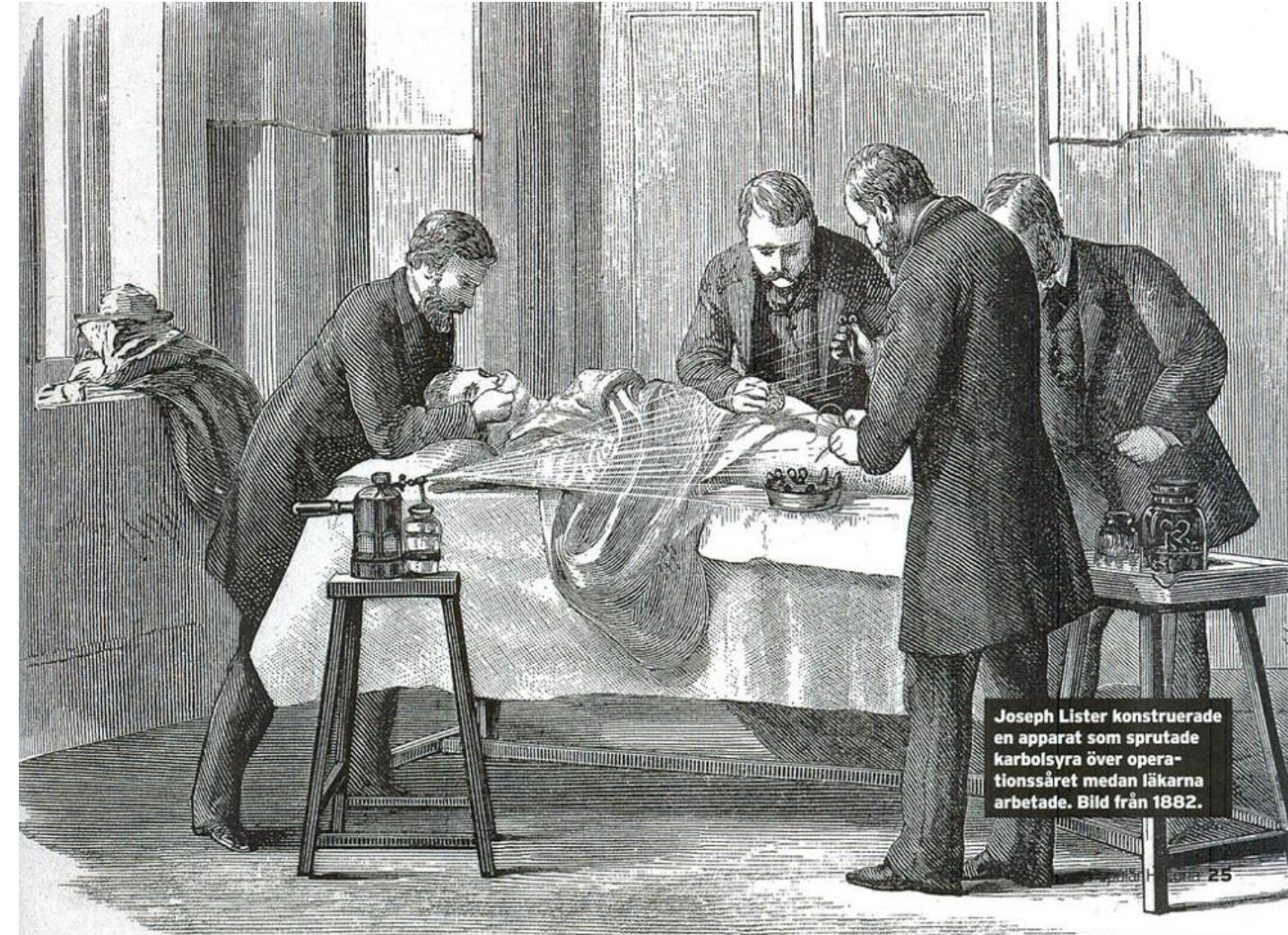


William Thomas Green Morton



1819-1868

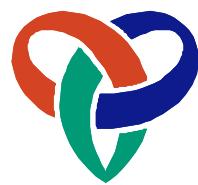
Lister pihustamas patsiendile karboolhapet





Orthopaedic Osseointegration: State of the Art

Musa B. Zaid, MD; Richard J. O'Donnell, MD; Benjamin K. Potter, MD; Jonathan A. Forsberg, MD, PhD
J Am Acad Orthop Surg. 2019;27(22):e977-e985



Bisphosphonates for Postmenopausal Osteoporosis

Kristine E. Ensrud, MD, MPH; Carolyn J. Crandall, MD, MS

First-line oral bisphosphonate treatment for postmenopausal osteoporosis

Recommended initial treatment	Optional initial treatment
Alendronate (70 mg/wk) or risedronate (35 mg/wk or 150 mg/mo)	Consider intravenous (IV) zoledronate (5 mg every 12 mo) to eliminate risk of gastrointestinal (GI) adverse effects and ensure adherence

Common obstacles to using oral bisphosphonates

Condition or obstacle	Recommended approach
GI intolerance to oral bisphosphonates	Emphasize adherence to dosing instructions and consider use of IV zoledronate
Impaired kidney function	Do not use oral or IV bisphosphonates if creatinine clearance is less than 30-35 mL/min
Poor adherence to treatment	Consider use of IV zoledronate
Concerns about serious harm caused by oral bisphosphonates	Consider oral health prior to bisphosphonate initiation; consider limiting initial treatment period to no more than 5 years; and reassess whether to reinitiate treatment 2-3 years after discontinuation

Alternative antiresorptive medications

Medication	Pros	Cons	Potential risks
Denosumab (subcutaneous, 60 mg every 6 mo)	<ul style="list-style-type: none"> Reduces vertebral and nonvertebral fractures (including hip fractures) Can use if creatinine clearance is less than 30-35 mL/min 	<ul style="list-style-type: none"> High cost Requires injections every 6 months 	<ul style="list-style-type: none"> Osteonecrosis of the jaw, atypical femoral fractures, rebound vertebral fractures upon discontinuation, and hypocalcemia
Raloxifene (oral, 60 mg daily)	<ul style="list-style-type: none"> Reduces vertebral fractures Reduces breast cancer in high-risk women 	<ul style="list-style-type: none"> No reduction in nonvertebral or hip fractures 	<ul style="list-style-type: none"> Venous thromboembolic events



Bisphosphonates for Postmenopausal Osteoporosis

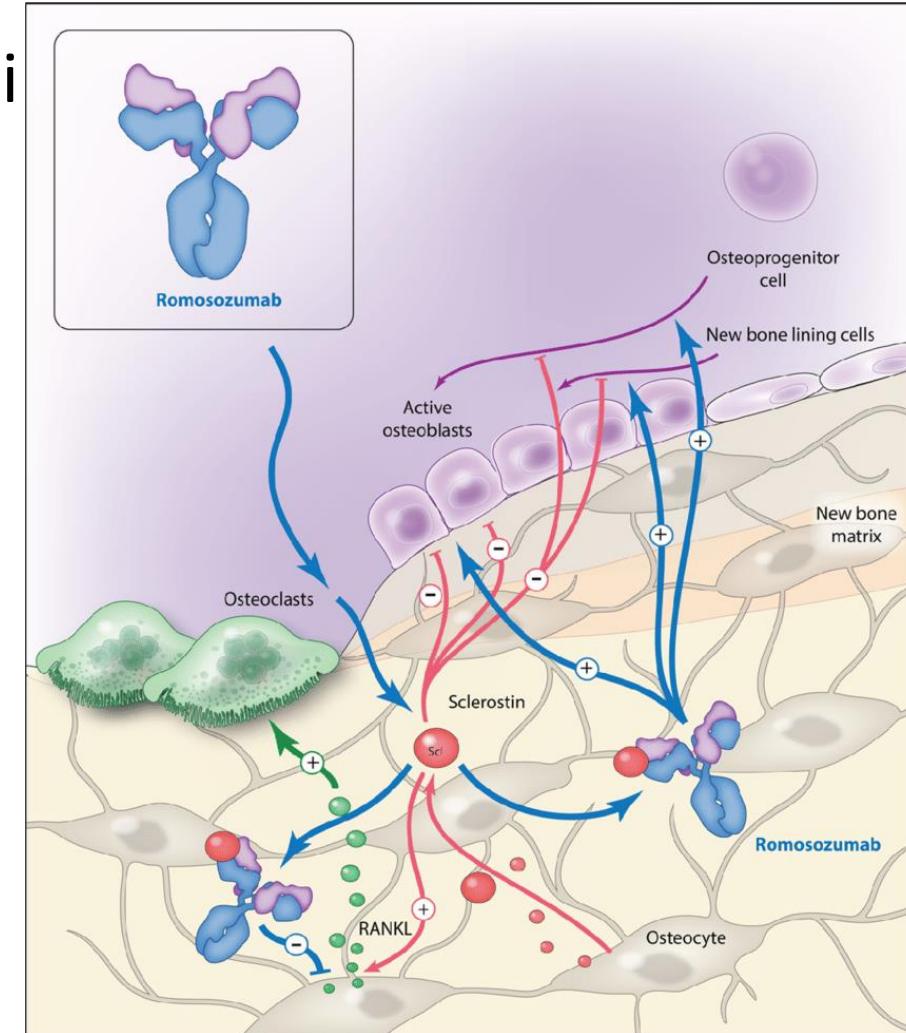
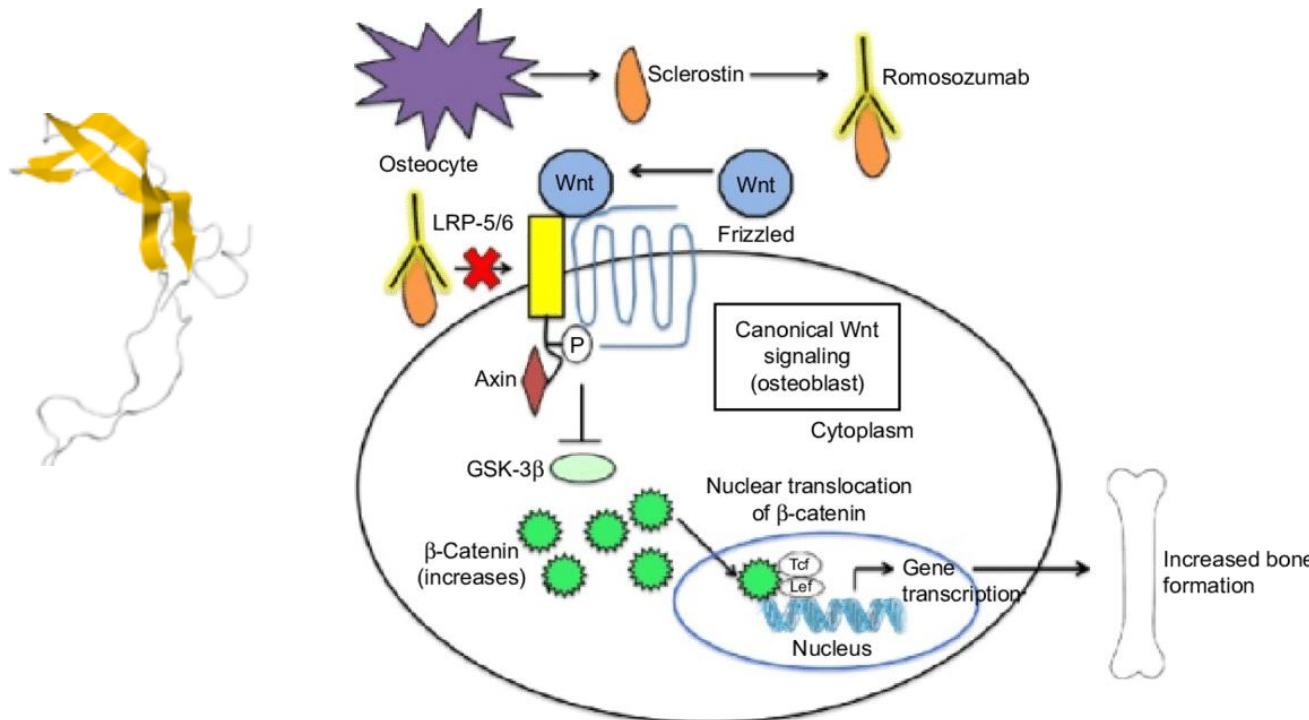
Kristine E. Ensrud, MD, MPH; Carolyn J. Crandall, MD, MS

Conclusions

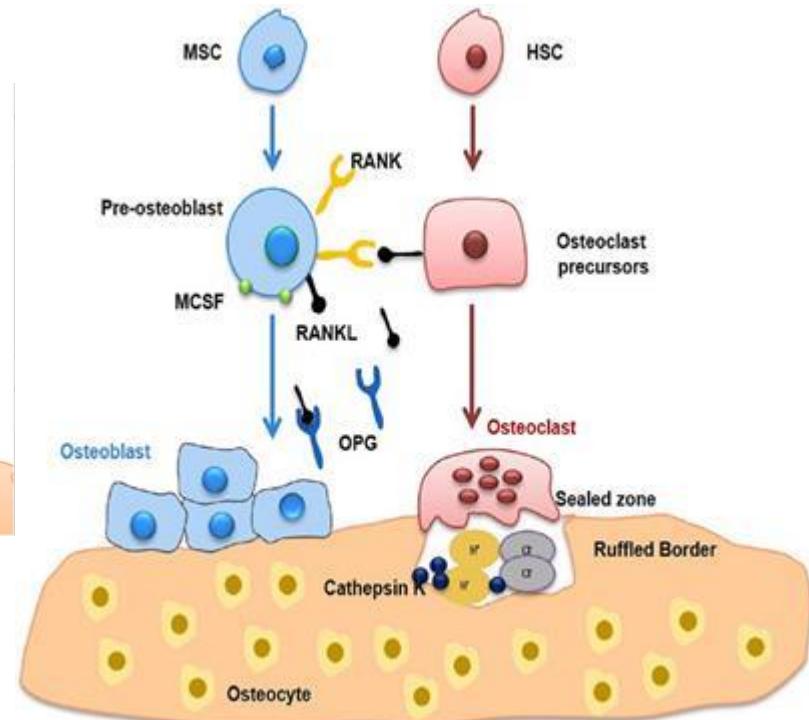
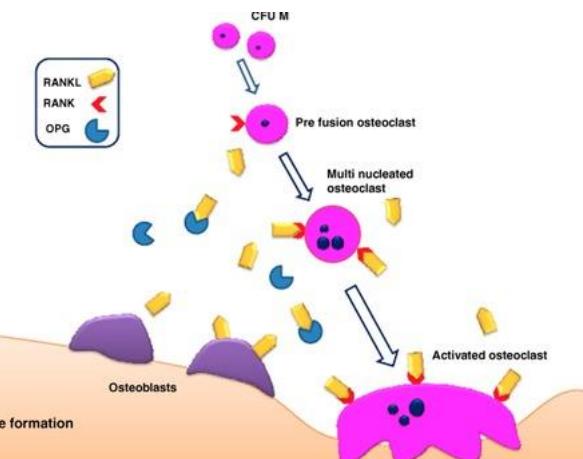
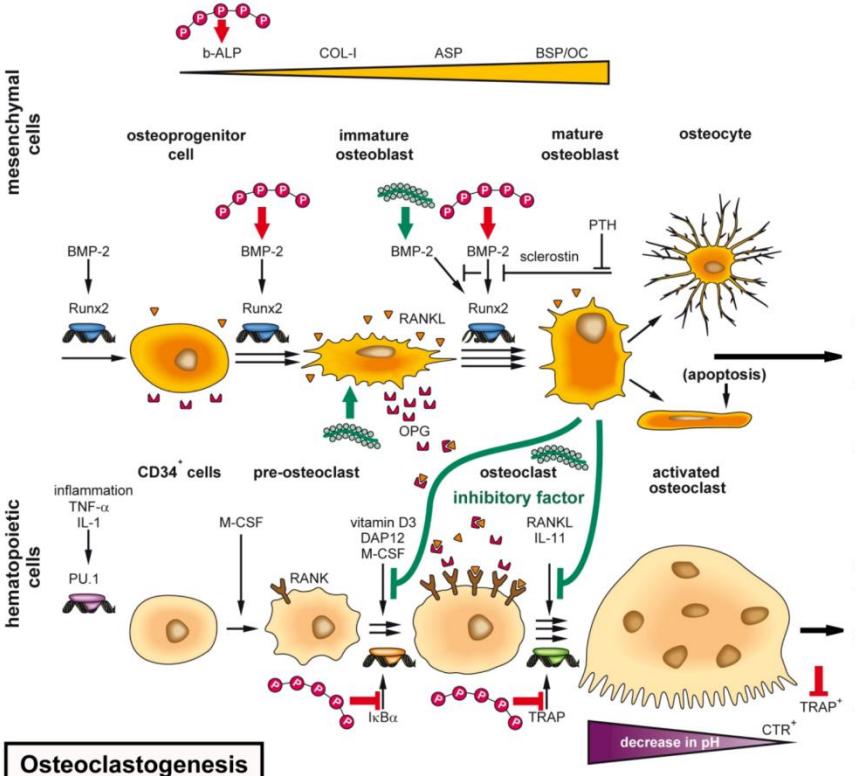
Due to their efficacy in fracture prevention, availability of long term safety data, and cost advantage over several other agents, bisphosphonates remain the first-line pharmacologic treatment for postmenopausal osteoporosis. Concerns about potential harms may be mitigated by targeting treatment to patients with higher absolute fracture risk, such as older women, women with previous fracture, and women with BMD T-scores less than or equal to -2.5 ; having good communication with patients; and limiting the treatment period to 5 years or less in patients without a fragility fracture before or during therapy who achieve a BMD T-score greater than -2.5 while receiving treatment.

Dual-Acting Osteoporosis Drug Romosozumab

- Monoklonaalne antikeha, mis seob sklerostiini
- Romosozumab**, brandi nimi **Evenity**



Osteoblastogenesis



The operation of the century: total hip replacement

Ian D Learmonth, Claire Young, Cecil Rorabeck

Lancet 2007; 370: 1508-19

Published Online

March 29, 2007

DOI:10.1016/S0140-
6736(07)60457-7

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In the 1960s, total hip replacement revolutionised management of elderly patients crippled with arthritis, with very good long-term results. Today, young patients present for hip-replacement surgery hoping to restore their quality of life, which typically includes physically demanding activities. Advances in bioengineering technology have driven development of hip prostheses. Both cemented and uncemented hips can provide durable fixation. Better materials and design have allowed use of large-bore bearings, which provide an increased range of motion with enhanced stability and very low wear. Minimally invasive surgery limits soft-tissue damage and facilitates accelerated discharge and rehabilitation. Short-term objectives must not compromise long-term performance. Computer-assisted surgery will contribute to reproducible and accurate placement of implants. Universal economic constraints in healthcare services dictate that further developments in total hip replacement will be governed by their cost-effectiveness.



**The Swedish Hip
Arthroplasty Register**
Annual Report 2016
FOR YEAR 2016

ANY HEALTH PROBLEMS YOU WISH TO DECLARE?

Akademiska sjukhuset
Alingsås
Ängelholm
Bolnäs - Söderhamn
Borås
Cedarskoga
Danderyd
Eksjö-Värnamo
Erlöv-Gislaved
Helsingborg
Hälsinge
Helsingör
Färnebo
Fränsta Spec. Sj.
Gävle
Göteborg
Halmstad
Härnösand
Huddinge
Husie och Kristianstad
Hässleholm
Kalmar
Karlskrona
Karlskoga
Kävlinge
Lund
Örebro
Malmö
Mora
Motala
Mörsunds Hamnstrand
Mjölby
Nacka och Danderyd
Norrtälje
Nyköping
Örebro och Örebro
Örebro och Stockholm
Örebro
Örebro
S:t Görans
Skellefteå
Doms
Skövde
Sollefteå
Söderhamn
Spånga
Sundsvall
Söderås
Söderås
Söderås
Torsby
Träslövsläge
Umeå
Västerås
Växjö
Västervik
Västerås
Växjö
Ångeholm
Örebro
Östersund
Östersund
Örebro

Annual Report 2009

The Swedish Knee Arthroplasty Register
Dept. of Orthopedics, Lund University Hospital



National Joint Registry
www.njrcentre.org.uk
Working for patients, driving forward quality



*Hip and Knee
Arthroplasty*



ANNUAL REPORT
2013



National Joint Replacement Registry



Nõuded implantaadi materjalidele

- Bioloogiline sobivus
- Korrosioonile vastupidavus
- Mehhaaniline tugevus
- Kulumiskindlus
- Kvaliteedi kontroll
- Mõistlik hind



Sulamid

Roostevaba teras

Co-Cr sulam

Titaan

Ta, Ag, Cu

Polümeerid

PMMA

UHMWPE

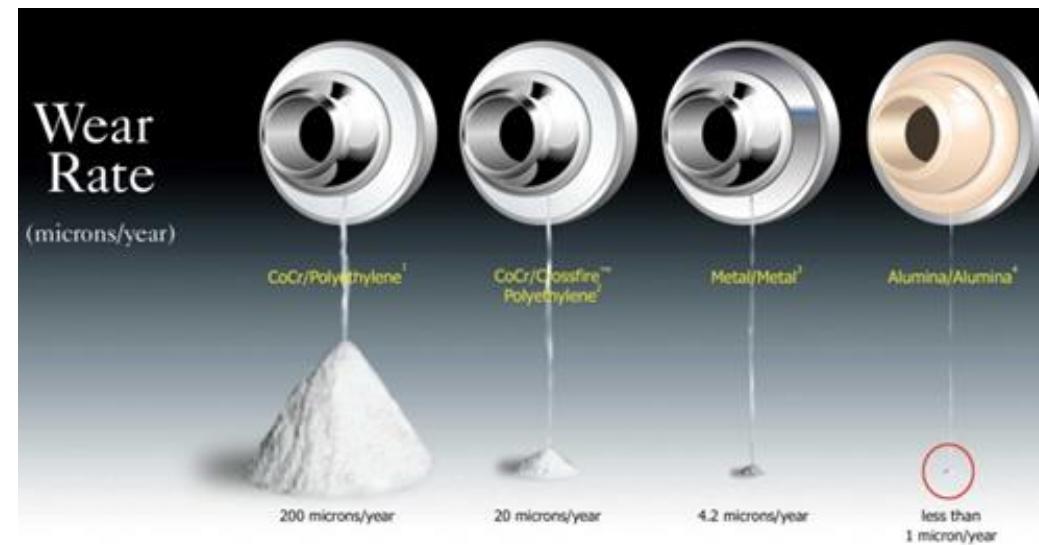
Keraamika

Al oksiid

Zr oksiid



Kulumine sõltuvalt materjalist



Wolfgang Pauli

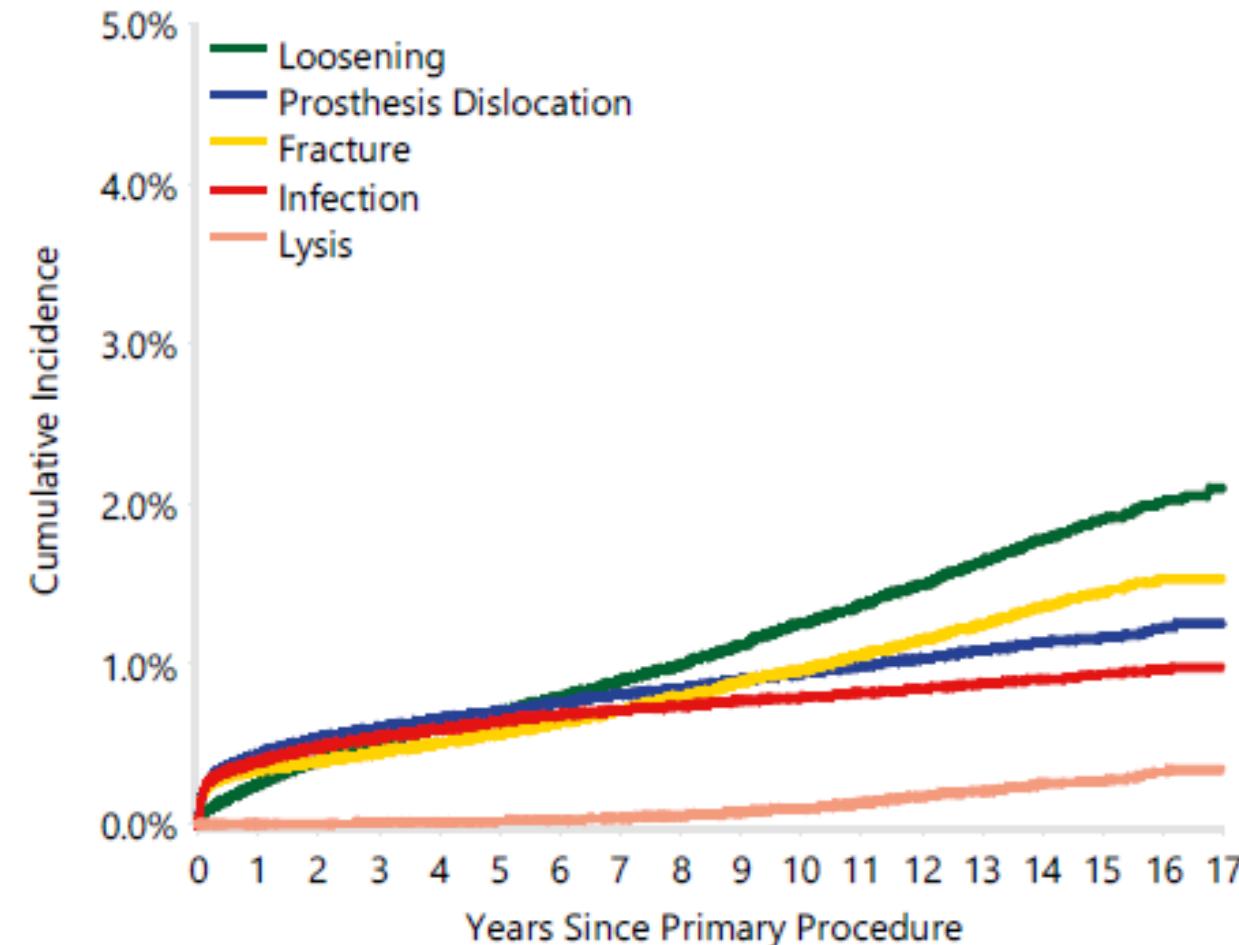


,,God made solids, but surfaces were the work of the devil“,

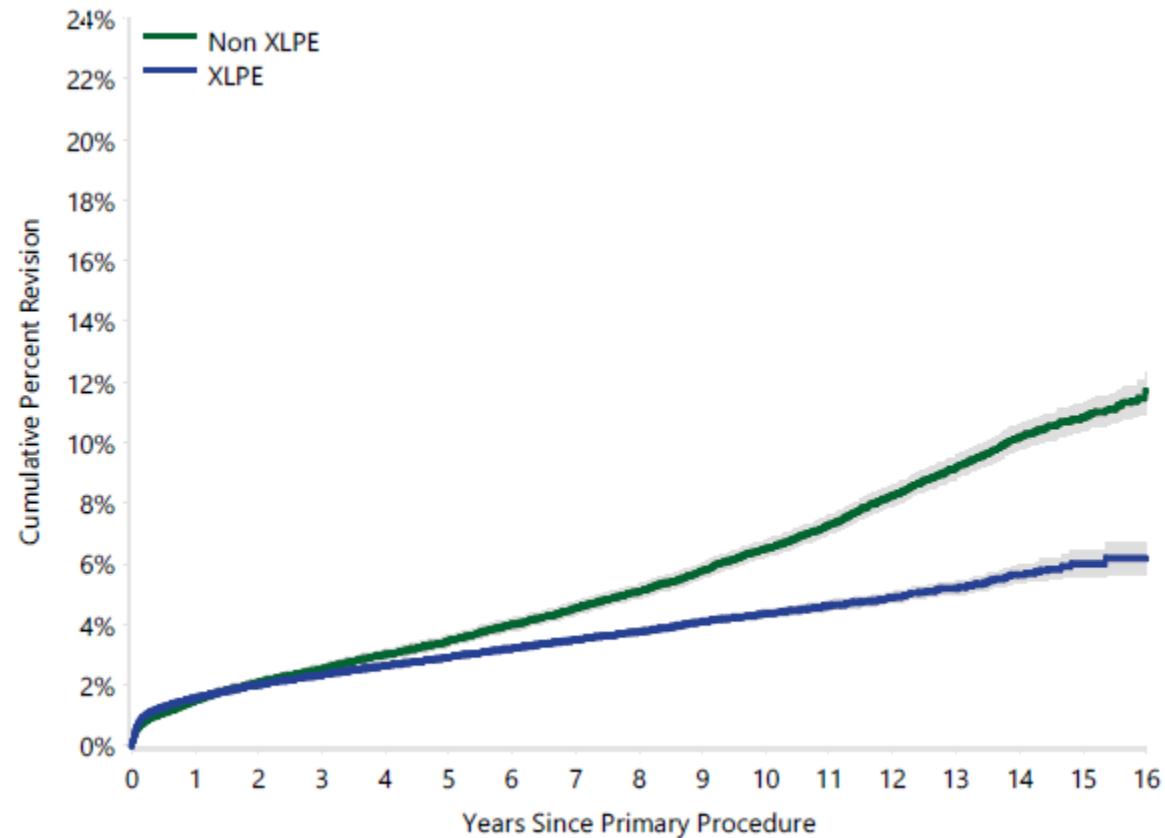
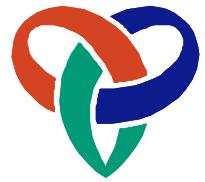
Wolfgang Pauli (1900-1958, Nobeli preemia 1945)



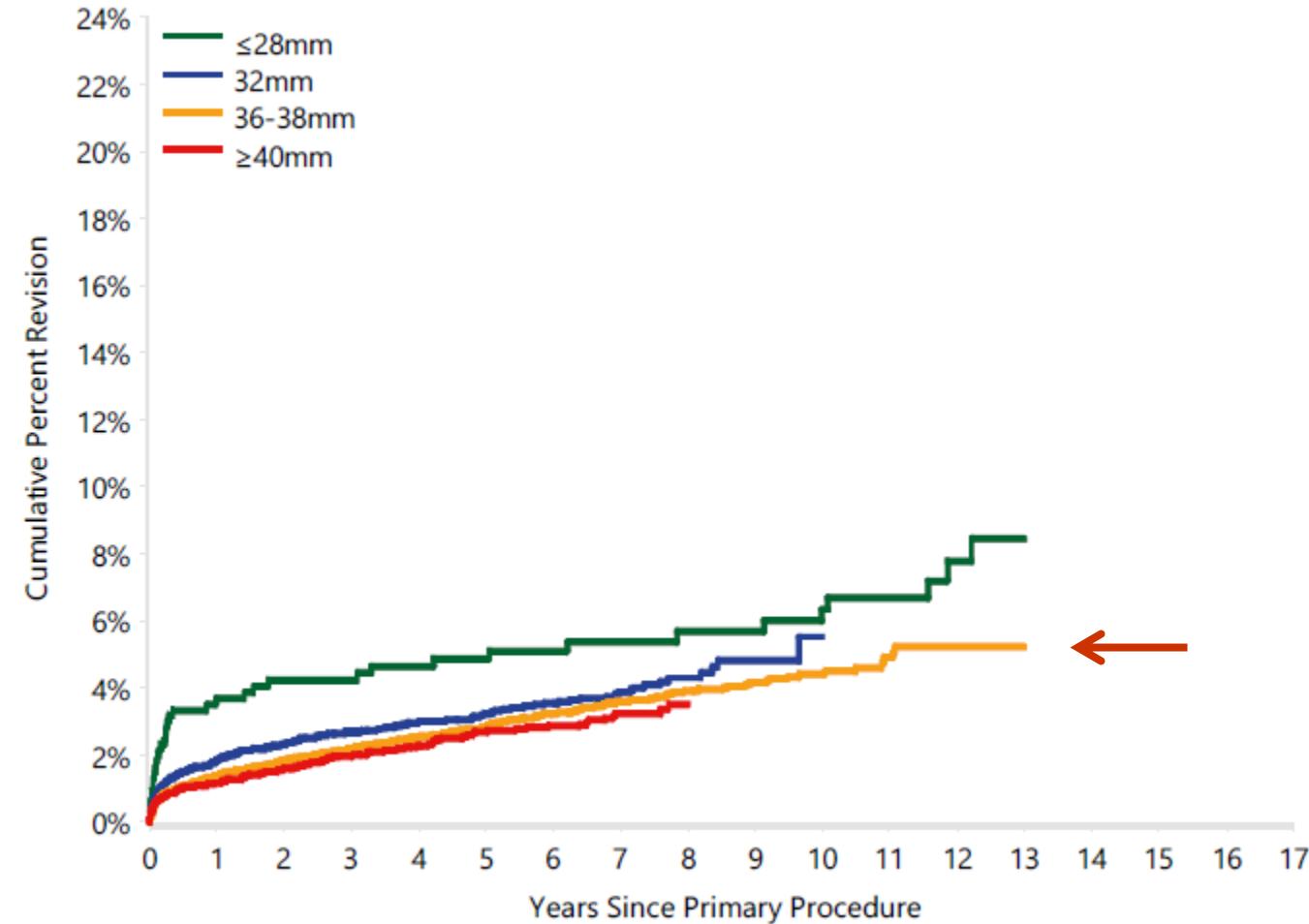
Proteesi loksumaminek revisjoni põhjusena



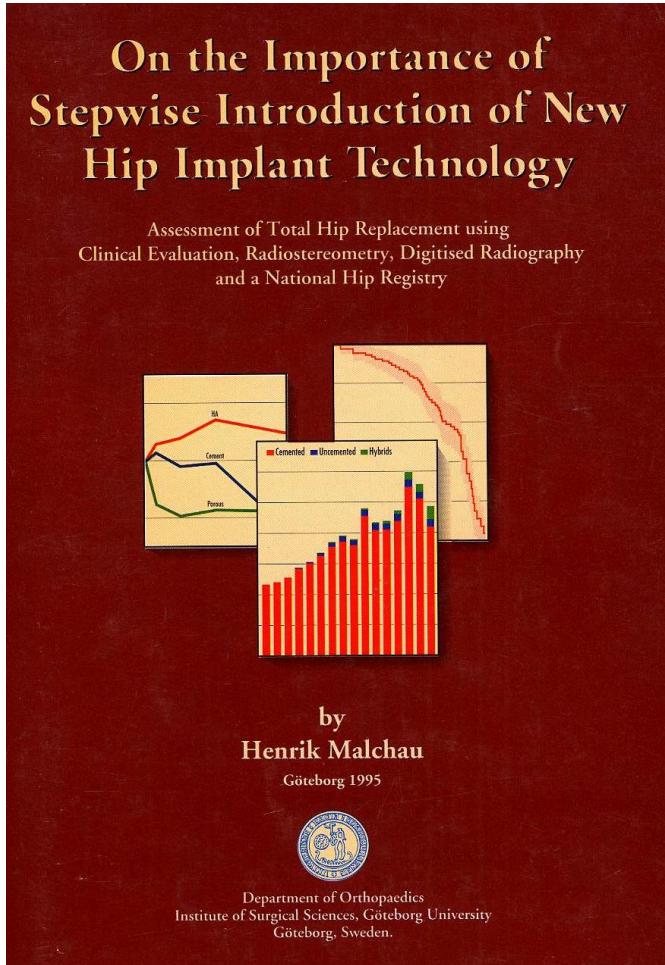
XLPE vs tavaline PE



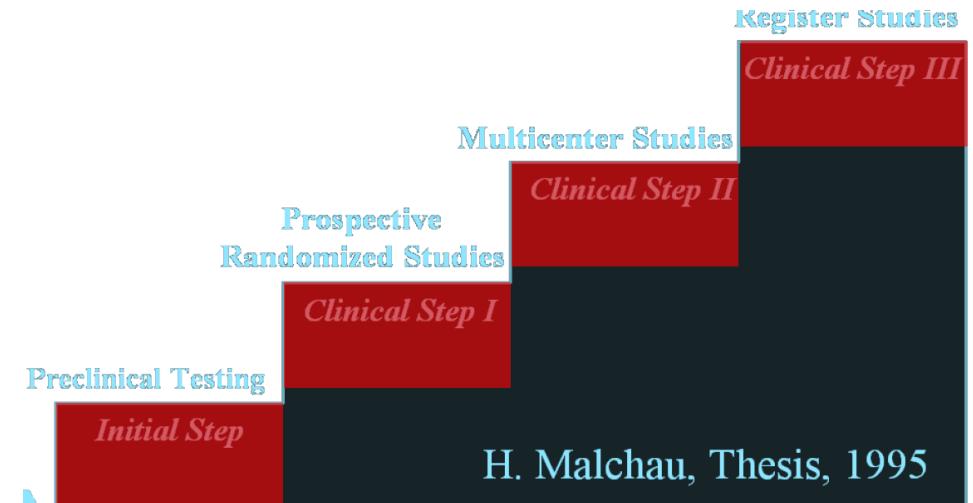
Parim elulemus pea läbimõõduga ≥ 36



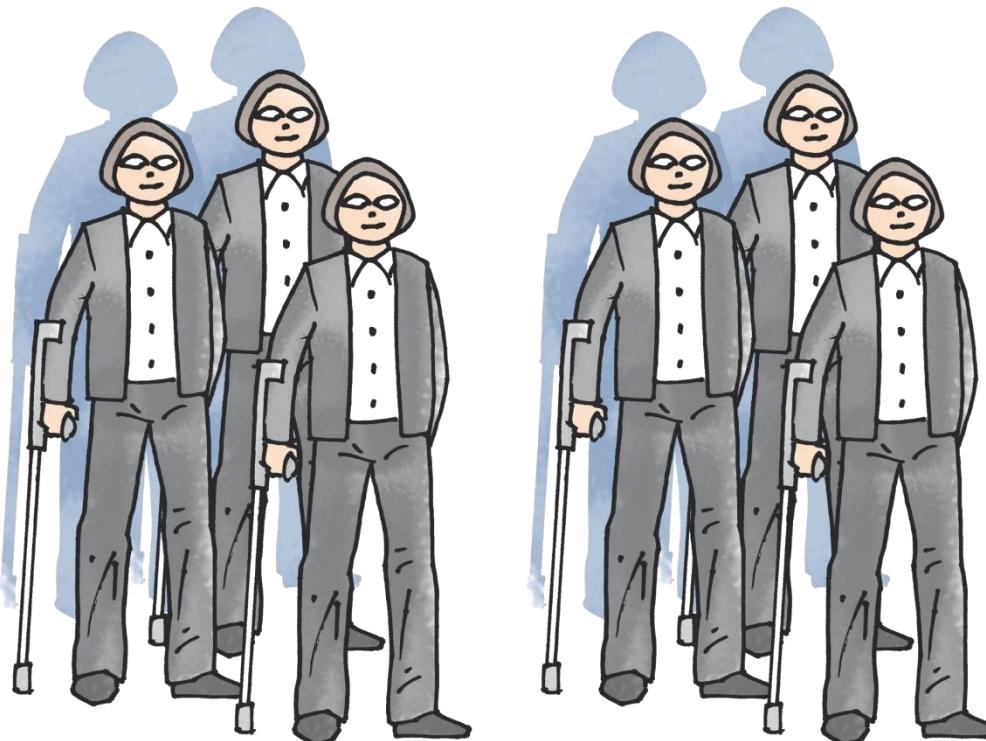
Uute implantaatide kasutuselevõtt



- Etapiline hinnang
- RCT valitud keskustes
- Mitmekeskuse uuringud
- Monitoorimine vähemalt 10 aastat



RCT



"REAL WORLD"





The NEW ENGLAND JOURNAL *of* MEDICINE

Perspective

JANUARY 10, 2013

The 510(k) Ancestry of a Metal-on-Metal Hip Implant

Brent M. Ardaugh, M.P.H., Stephen E. Graves, M.B., B.S., and Rita F. Redberg, M.D.

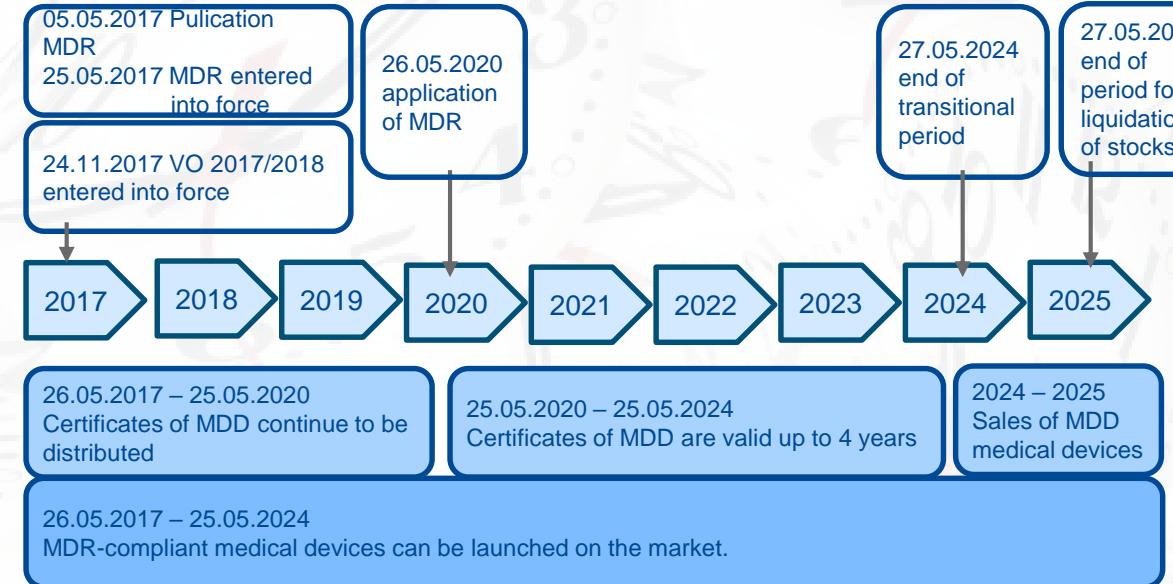
Many medical devices that pose great safety risks to Americans, including metal-on-metal hip implants, currently enter the U.S. market through a Food and Drug Administration (FDA) regulatory

This ancestry reveals serious flaws in the 510(k) procedure for metal-on-metal hips, which resulted in clearance of a new device that was never shown to be safe and effective.

Metal-on-Metal



Timeline for MDR introduction



MEDICAL TECHNOLOGY

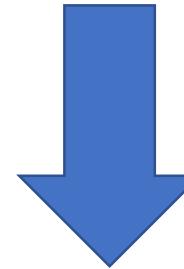
can be nearly any technology used to **save** and **improve** lives of individuals suffering from a wide range of conditions.



There are more than **500,000 products, services and solutions** currently available

Mis toimub?

ülereguleerimine ja liiga palju bürokraatiat



keeruline dokumentatsioon nõutav igaühele

Uus MDR

(*medical device regulation*)

- Suur mõju ortopediale ja traumatoloogiale
 - Implantaadid & Instrumendid
 - Uued / vahetatavad implantaadid / instrumendid
 - Implantaadid / instrumendid mis on juba turul



Aimatavad tegevused: EU

- EU komisjon peab otsustama:

- Tegevused, sisu ja kvalifitseerumise tingimused, kuidas uued implantaadid saavad Euroopa turule



- EU peab tegema:

- Ekspertide paneelid, kes neid abistavad
- Kinnitama need ja olema nendega nõus
- Õpetama neid
- Fikseerima andmed, mis on vaja et implantaat/ instrument saaks turule tulla

Aimatavad tegevused : tööstus

- Uued/ vahetatud implantaadid / instrumentid vajavad rohkem täpsustatud informatsiooni enne kui on EU turul aktsepteeritud
- Sama implantaatidele / instrumentidele, mis on juba turul
- Vajab väga tihedat koostööd - haiglad/ jt. institutsioonid
- Kallis protsess!!
- Tulemuseks võib olla ärimudeli muutus
- ”portfolio” ülevaatus – vähendada??
 - Eemaldatakse odavaimad/ vanimad / ”risky” implants
 - Jäävad uued, väärthuslikumad, kallimad implantaadid

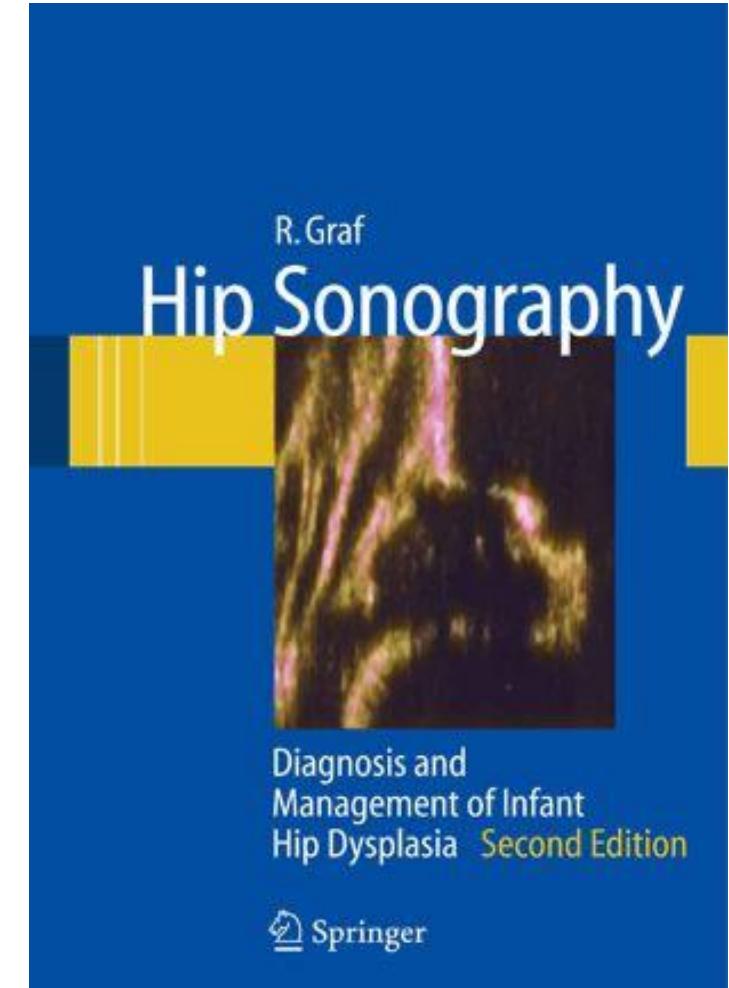


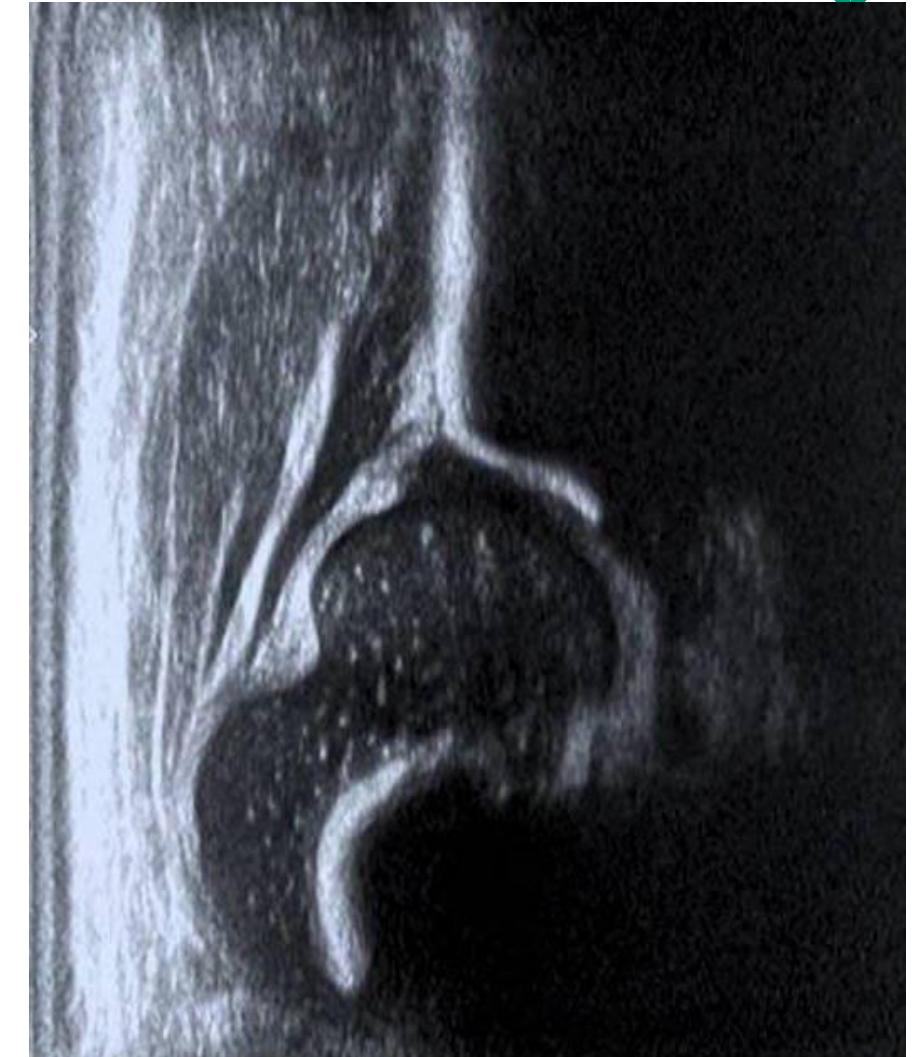
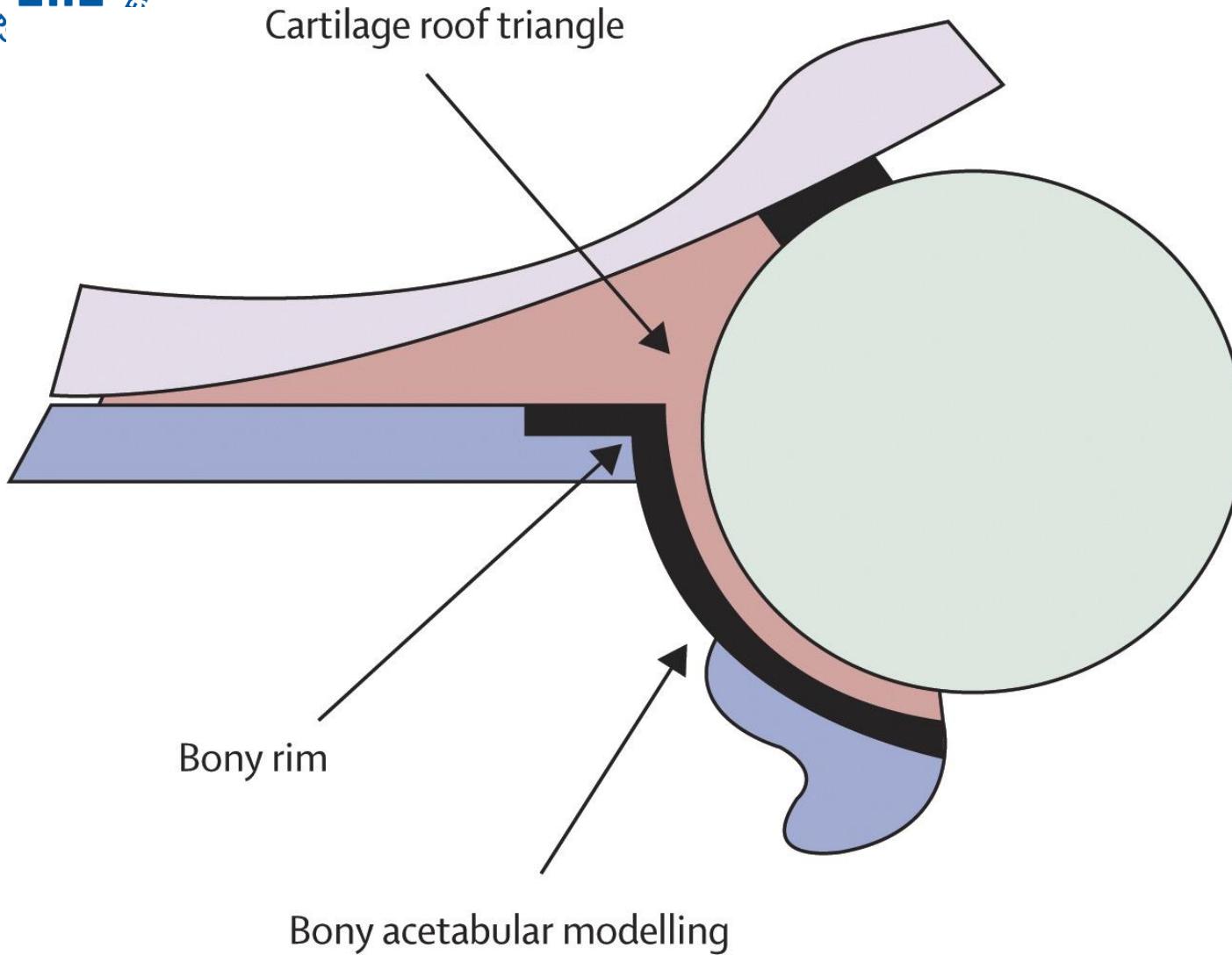
Aimatavad tegevused : haiglad

- Väiksem implantaatide valik (pos)
- End tõestanud (odavad) implantaadid kaovad turult(neg)
- Tarneprobleemid (neg)
- Implantaatide kallinemine (neg)

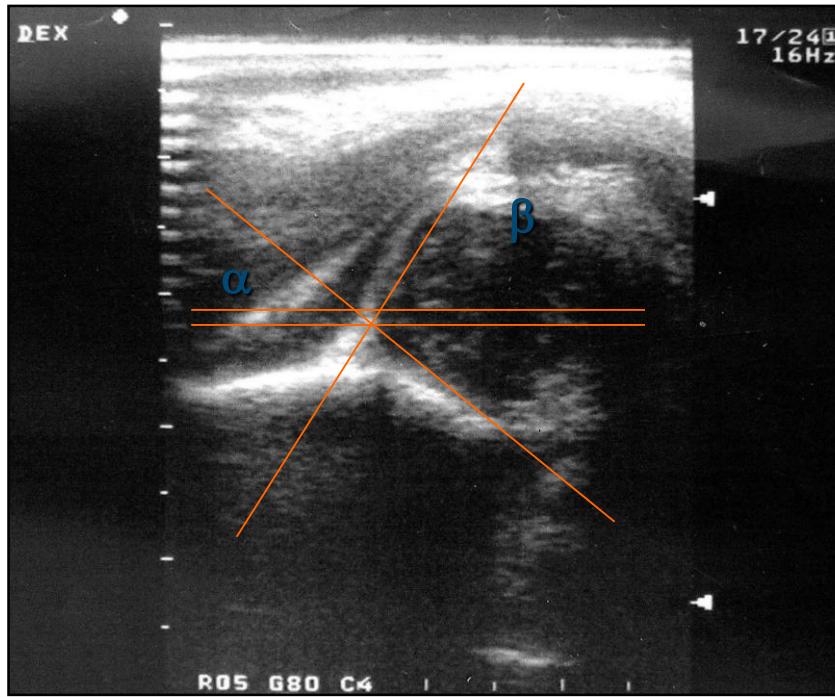


Professor Reinhard Graf

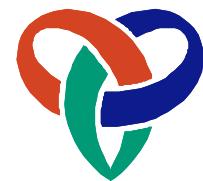




Ultraheliuuring



	α	β	
Ia	>60	<55	stab
Ib	>60	>55	stab
IIa	50-59	>55	stab <3 kuu
IIb	50-59	>55	stab >3 kuu
IIc	43-49	<77	stab
IId	43-49	<77	sublux
III	<34	>77	dislotseeritav
IV	<34	>77	dislok



Arthroscopic partial meniscectomy for meniscal tears of the knee: a systematic review and meta-analysis

Simon G F Abram,^{✉ 1} Sally Hopewell,^{1,2} Andrew Paul Monk,^{✉ 1} Lee E Bayliss,¹
David J Beard,¹ Andrew J Price^{✉ 1}

What is already known

- ▶ Arthroscopic partial meniscectomy (APM) is one of the most commonly performed surgical procedures worldwide, and rates have risen, particularly in older age groups susceptible to degenerative knee disease.
- ▶ Previous systematic reviews have demonstrated that undifferentiated knee arthroscopy (lavage, debridement and/or APM) performed for pain associated with degenerative knee disease is ineffective. The effectiveness of APM, specifically in patients stratified according to the important clinical and radiological patient selection factors, is unknown.

What are the new findings

- ▶ This systematic review indicates that surgical treatment should not be the first-line treatment intervention for patients with a meniscal tear.
- ▶ APM provides a small improvement in all people and small to moderate improvement in those without osteoarthritis, from reduction in pain and improvement in function and quality of life, compared with physiotherapy, but the clinical importance of these improvements is uncertain.
- ▶ Patients meeting the latest, strict, clinical and radiological selection criteria for APM are not represented by the current evidence, and no study has been limited to patients who have failed non-surgical treatment. There is an urgent need for trial evidence in this group to inform clinical guidelines and practice.



Osteoarthritis and Cartilage



Editorial

The importance of getting it right the first time



In this issue of Osteoarthritis and Cartilage, Abram and coworkers report an increase in the proportion of patients undergoing knee arthroplasty (TKR) within 1 or 2 years of arthroscopic partial meniscectomy (APM). The proportion of patients, all in care funded by the National Health Service in England, undergoing TKR **within 1 year of APM increased by 141% between 1997 and 2016**. The authors noted particularly high rates of TKR conversion for patients over the age of 60 years, with a 1-year rate of APM to TKR conversion of 10% and a 2-year rate of 17%.



VIEWPOINT

Joshua M. Sharfstein,
MD

Johns Hopkins
Bloomberg School of
Public Health,
Baltimore, Maryland.

Yngvild Olsen, MD,
MPH

Institutes for Behavior
Resources Inc,

Lessons Learned From the Opioid Epidemic

Oklahoma's recent settlements with Purdue Pharma and Teva Pharmaceuticals, and the trial in the state's lawsuit against Johnson & Johnson, signal that the opioid epidemic is entering a new era of accountability. Hundreds of cities and counties and about 2 dozen states are also pursuing litigation against opioid manufacturers.

The legal system should hold the pharmaceutical

in coordination with other therapies. Patients benefit from education, understanding, and support as they co-manage their conditions.

Second, accept no substitutes for high-quality clinical evidence. In 1995, Purdue Pharma corrupted the Food and Drug Administration (FDA)—in part by presenting compelling clinical evidence—to add to the market its highly addictive painkiller OxyContin. The FDA accepted the company's claims without requiring any evidence that the drug was safe or effective.

Hundreds of thousands of individuals in the United States have died of opioid-related causes, millions have become addicted, and billions of dollars of economic value have been lost.

RESEARCH ARTICLE

Open Access

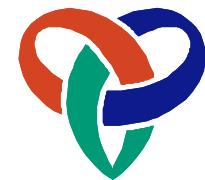


Opioid use after total hip arthroplasty surgery is associated with revision surgery

Maria C. S. Inacio^{MS, PhD^{1*}}, Nicole L. Pratt^{PhD^{1,2}}, Elizabeth E. Roughead^{PhD^{1,2}}, Elizabeth W. Paxton^{MA³} and Stephen E. Graves^{MD, PhD⁴}

Conclusions: Opioid use 91–180 days post-surgery is associated with higher risk of revision surgery and therefore is an early and useful indicator for surgical failure.

Opioidide pikajaline kasutamine mõjutab patsiendi rahulolu ja suurendab revisjonoperatsiooni riski



Perekond Sackleri varanduse suuruseks arvutatakse 13-14 miljardit dollari. Neid peetakse üheks Ameerika rikamaks perekeks. Kuna ettevõte Purdue Pharma pole börsile läinud, jaguneb varandus umbes 20 nöbü ja hõimlase vahel.

Klantsajakirjades ilmub nende kohta harva muinasjutulisi lugusid, küll aga teatakse neid kui heldekäelisi filantroope, kes jagavad miljoneid kunstimuuseumide ja teadusprojektidele.

Möödunud sajandi viiekümnendatel aastatel panid kolm psühholoogilise nõustaja psühholoogilise nõustaja Tiina Jõgeda annab nõu.

Oxycontini toimeainet oksükoodooni saadakse moonist, ravim ise on sünteesiline opioid ehk lähedalt sugulane heroiniga.

Vendade (nüüdseks juba manalameeste) järeltulijad ajavad perekonnaäri edasi, nende naisi ja tütreid aga kummardatakse lõpututel heategevusüritustel... Siinkohal muinasjutt önnelikest rikastest ja ilusatest paraku lõpeb.

Korraga püüavad köik, kellele Purdue Pharma miljonid nii teretulnud olid, oma sidemeid ettevõttega maha salata.

Ühe venna järeltulijad, kes müüsid oma osaluse ettevõttes maha juba enne, kui sellest üldse miljardibnis sai, toonitavad intervjuudes, et neid ei maksa selle vastiku ja ebamoraalse äriga mingil juhul seostada. Lapselaps Madeleine, kes püüab

ÕNNE VALEM

...on rubriik, kus psühholoogiline nõustaja Tiina Jõgeda annab nõu.



TIINA JÕGEDA
tiina.jogeda@ekspress.ee

Valuimpeerium varises

Legaalne наркотикум відноситься до Америки.

filminduses läbi lüüa, korrutab, et temal pole vanaisa kompaniiga midagi pistmist.

Korraga ei kõlba Sacklerite miljonid isegi asutustele, kes on aastaid filantropide perekonnale annetuste eest tänlukud olnud. Näiteks teatas New Yorgi Metropolitani muuseum käesoleva aasta mais, et nad loobuvad Purdue Pharma annetustest. Samamoodi loid valusa plaksga vastu annetaja kätt ka paljud ülikoolid, muuseumid ja mittetulundusühingud.

Kathe ja Mortimer Sackler „ei mahtunud“ enam New Yorgi teaduste akadeemia nõukogusse. Mortimer oli 20 aastat olnud ka Guggenheimis, enam mitte. National Portrait Gallery Londonis lükkas tagasi 1,3 miljoni dollari suuruse toetussumma. Columbia ülikool, kus asub Sackleri arengupsühholoolgia instituut, ütles, et Neil pole sellenimelise finantseerijaga enam mingit tegemist. Jne.

Multimiljardäridest on korraga saanud paariad. Jacqueline Sackler nutab, et ei kujuta ette, kuidas tema poeg saab üldse põhikoolis edasi käia.

Miks järeltulijad häbenevad oma rikkaid esivanemaid? Mis sunnib asutusi, mis püsivadki elus ainult täna heategijatele, kätuma järsku nii ülbelt?

Aga sellepärast, et inimlike kannatusi leevendama möeldud Oxycontin osutus hoopis mõnuaineeks. Preparaadi legalne müük käivitas Ameerikas opioidikriisi.

Iga päev sureb Ameerikas opioidide üledoosi sadakond inimest. Neist kaks kolmandikku hukkuvad narkootilise toimega valuvaigistite töltu, vaid üks kolmandik heroiini töltu. Üle poole heroiinitarvitajatest kinnitavad, et nende allakäik sai alguse retseptiga väljastatavatest tablettidest.

2015. aastal ületas üledoosisurmade

arv USA-s esimest korda tulirelvade läbi hukkunute arvu.

Rahvuslikus opioidiepileemias on süüdi Purdue Pharma!

Purdue Pharma peakorter asub Connecticuti osariigis Stamfordis, hoone näeb välja nagu hiiglaslik tabletikarp: kliiniline valge nelinurkne kõrghoone.

Lainud aasta augustis täitus hoone esine könnitee aga tuhandete väikeste ümmargustega - tühjade - tabletipurgikatega. Need kandsid kokku protestijad, inimesed, kes olid kaotanud oma lähedased tabletipurgi sisule - Oxycontinile.

Legaalset opioidi tootev farmaatsiagigant käib kohut juba 2007. aastast, selle omanikele on määratud ka kriminaalkaristusi (eeskätt seetõttu, et tehti arstide hulgas lausreklami ja levitati valeinfot, kuidas oksükoodoon ei tekita eriti sõltuvust). Mõni päev tagasi tuli aga eriti karm otsus: firma lastakse pankrotti ja omanikud peavad riigitoludesse maksma seitsme aasta jooksul üle kolme miljardi dollari.

Tabletisõltuvus on tösine probleem, nagu ka retseptivabrikute vohamine. Ameerikas kirjutatakse tugevatoimelist valuvaigistit töesti kergekäeliselt välja, ka lastele. Eestis on olukord teine - meie arstid on Oxycontini välja kirjutades üliettevälilised, vähiaaged kurdavad, et neil on raske arstilt retsepti saada. Iga üksiku tableti üle peetakse mitmekordset arvestust (lisaks digirestseptile kantakse ost apteegis ka pastakaga ruudulisse kaustikusse). Loodame, et voitluses tabletikriminaalidega ei jäää kannatajaks need, kes seda rohut tegelikult väga vajavad. ●

Ortopeedia tulevik

- Robotid, tehisintelligents
- Ravimit eraldavad implantaadid
- Artroskoopia arengud
- Haigust modifitseerivad ravimid
- Tissue engineering
 - „tagavaraosade tootmine“
 - Bioloogilised
 - Tehismaterjalid
- Geeniterapia
 - Personaalmeditsiin
- Kaasuvad haigused
- ravimite koostoime
- Vananemise bioloogia, tervelt vananemine

Implant signal detection

Imaging

Care processes

Mobile devices

Decision-making

AI

Robotics

HIP PAIN

Genetics

ARTHRITIS

HIP ARTHRITIS

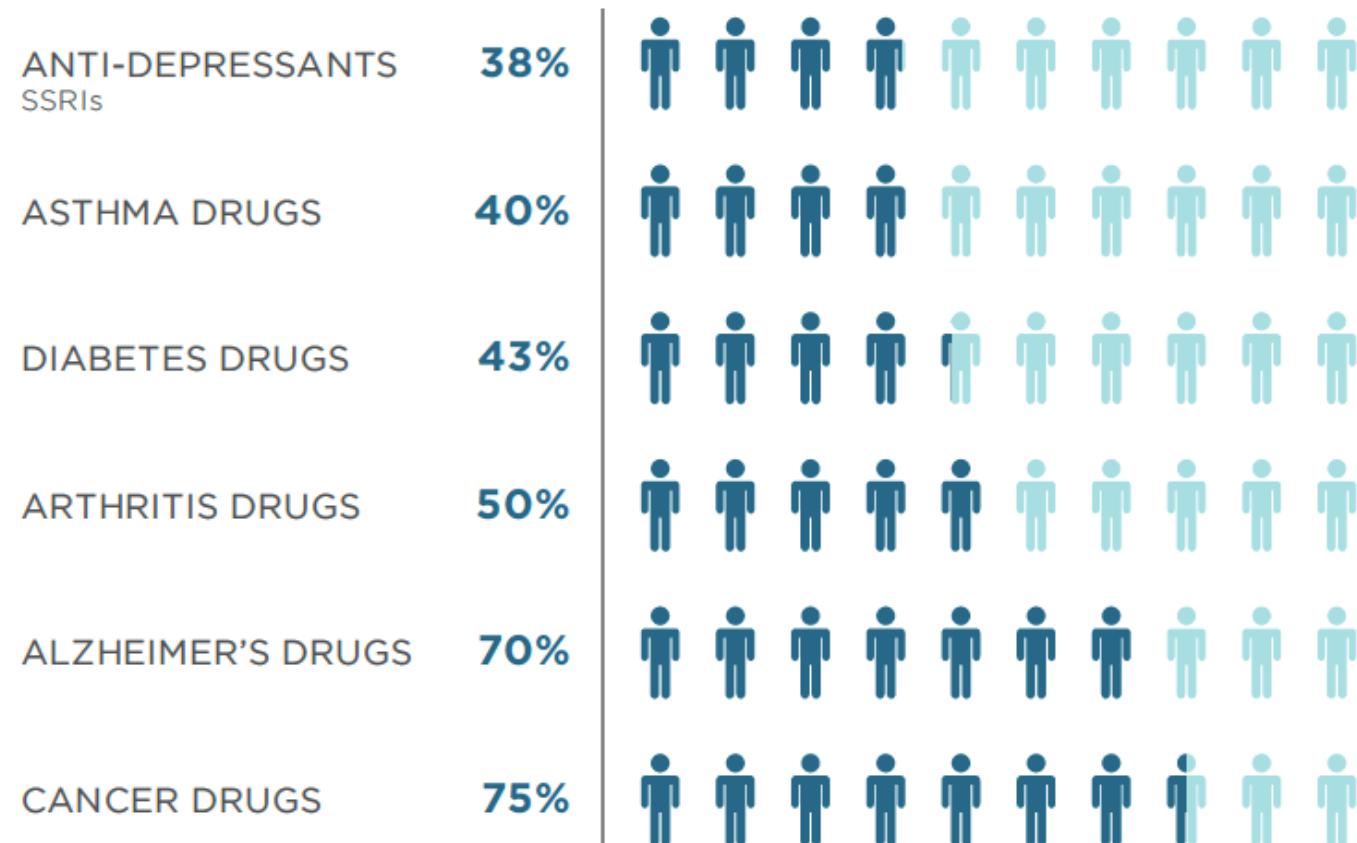
PAIN

OSTEOARTHRITIS



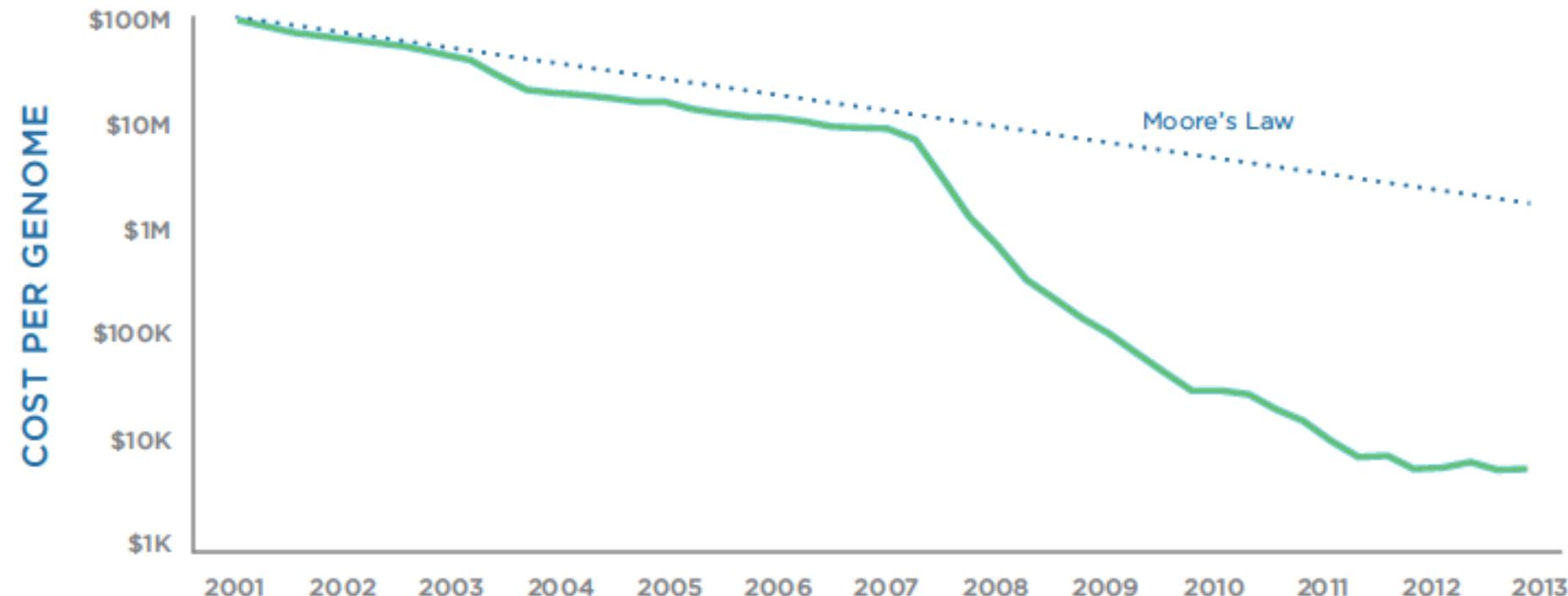
One size does not fit all

Percentage of the patient population for which a particular drug in a class is ineffective, on average

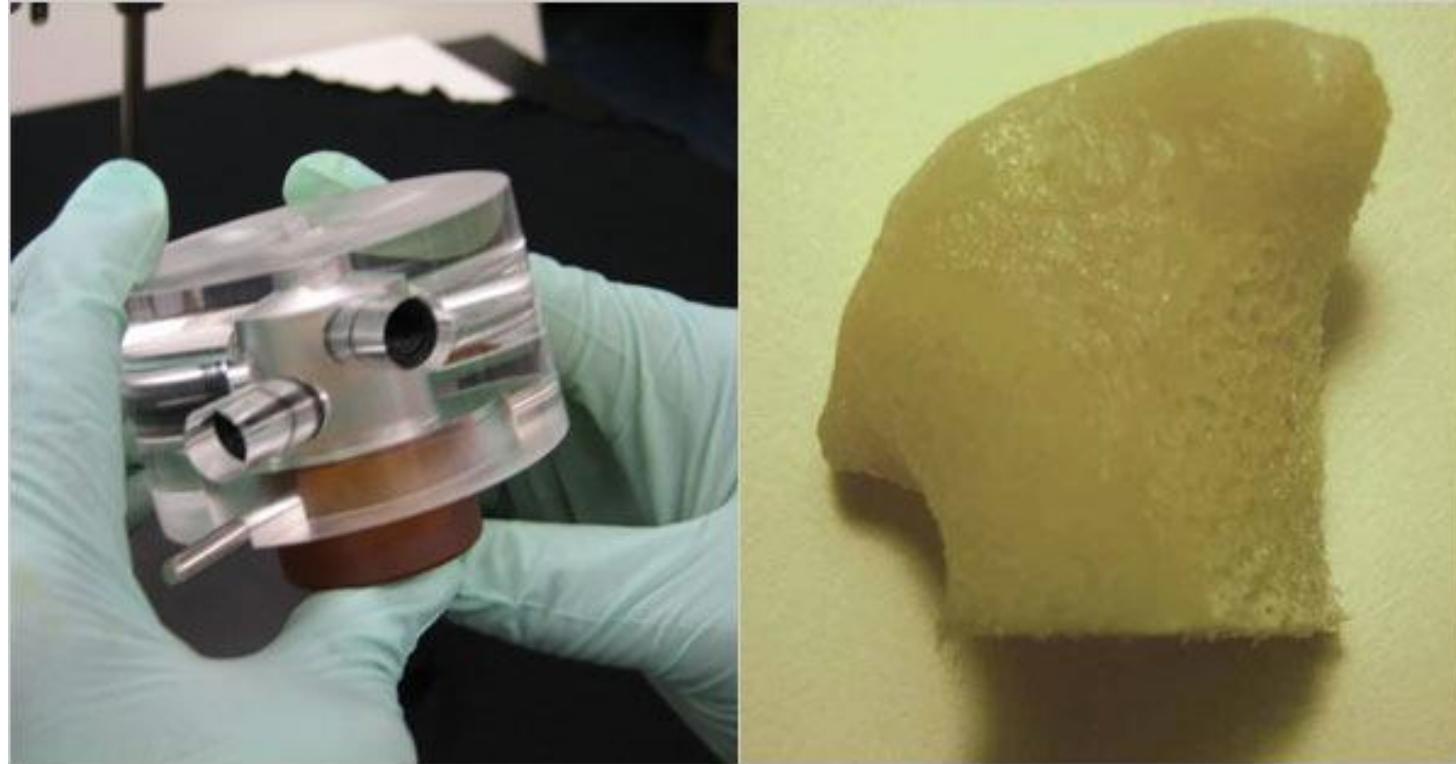


Source: Brian B. Spear, Margo Heath-Chiozzi, Jeffrey Huff, "Clinical Trends in Molecular Medicine," Volume 7, Issue 5, 1 May 2001, pages 201-204.

Inimese genoomi sekveneerimise hind on väga oluliselt langenud

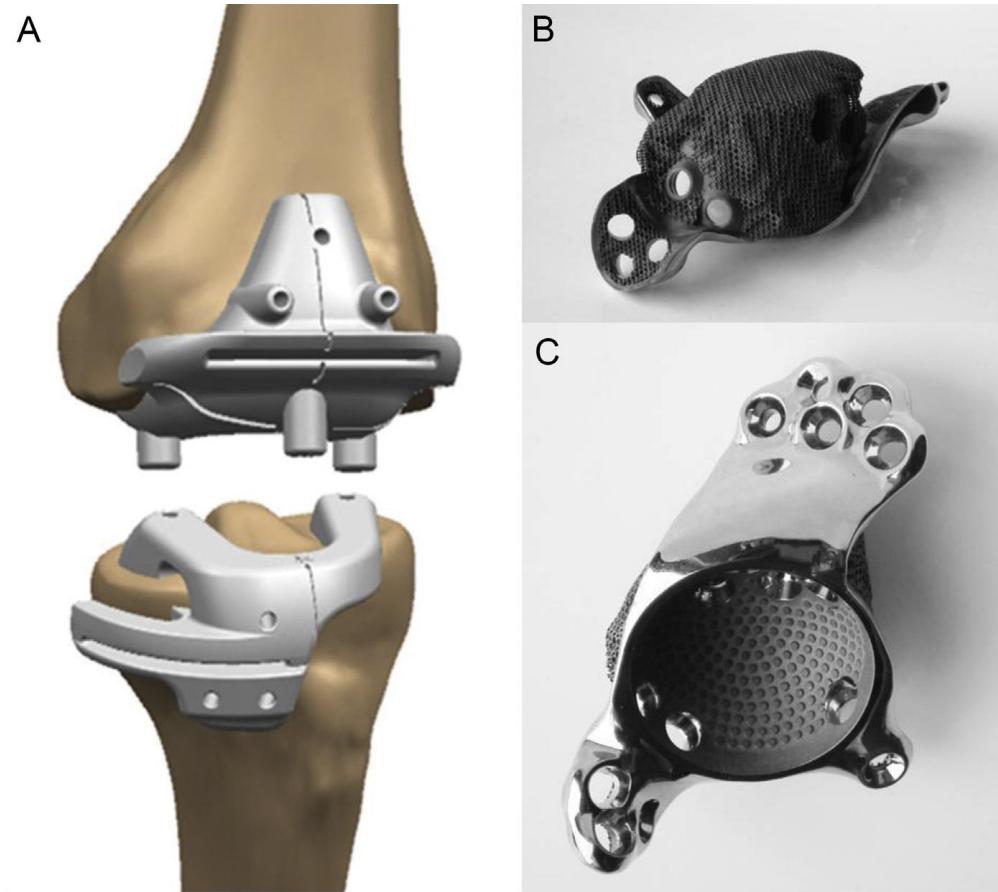


Tissue-engineered bones



Anne Eisenberg New York Times March 27, 2010

(A) Patient-specific sawguides for total knee arthroplasty (Smith & Nephew, USA) and (B, C) custom-made titanium acetabulum implant with screw planning (Materialise, Belgium)



From the printer: Potential of three-dimensional printing for orthopaedic applications
Journal of Orthopaedic Translation (2016) 6, 42-49; <http://dx.doi.org/10.1016/j.jot.2016.04.003>

Ankylosing spondylitis

To conclude, the coming of age of whole-exome and genome sequencing, combined with improved study designs and technological advancements, **most notably single-cell genomics, is likely to reveal some of the hidden genomic mysteries associated with AS and advance precision medicine in the treatment of this debilitating disease.**

O'Rielly, Darren D.; Uddin, Mohammed; Rahman, Proton. Ankylosing spondylitis: beyond genome-wide association studies. Current Opinion in Rheumatology Vol 28, No 4, July 2016

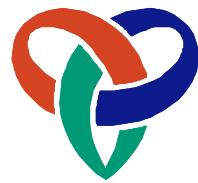
“Though making the connection between a variance in the genome and a particular disease is **very far away from treatment**,” says Bult, “it is a very crucial step in precision medicine.”



The Journal of Arthroplasty

Available online 12 November 2019

In Press, Journal Pre-proof



The genetic variations associated with time to aseptic loosening after total joint arthroplasty

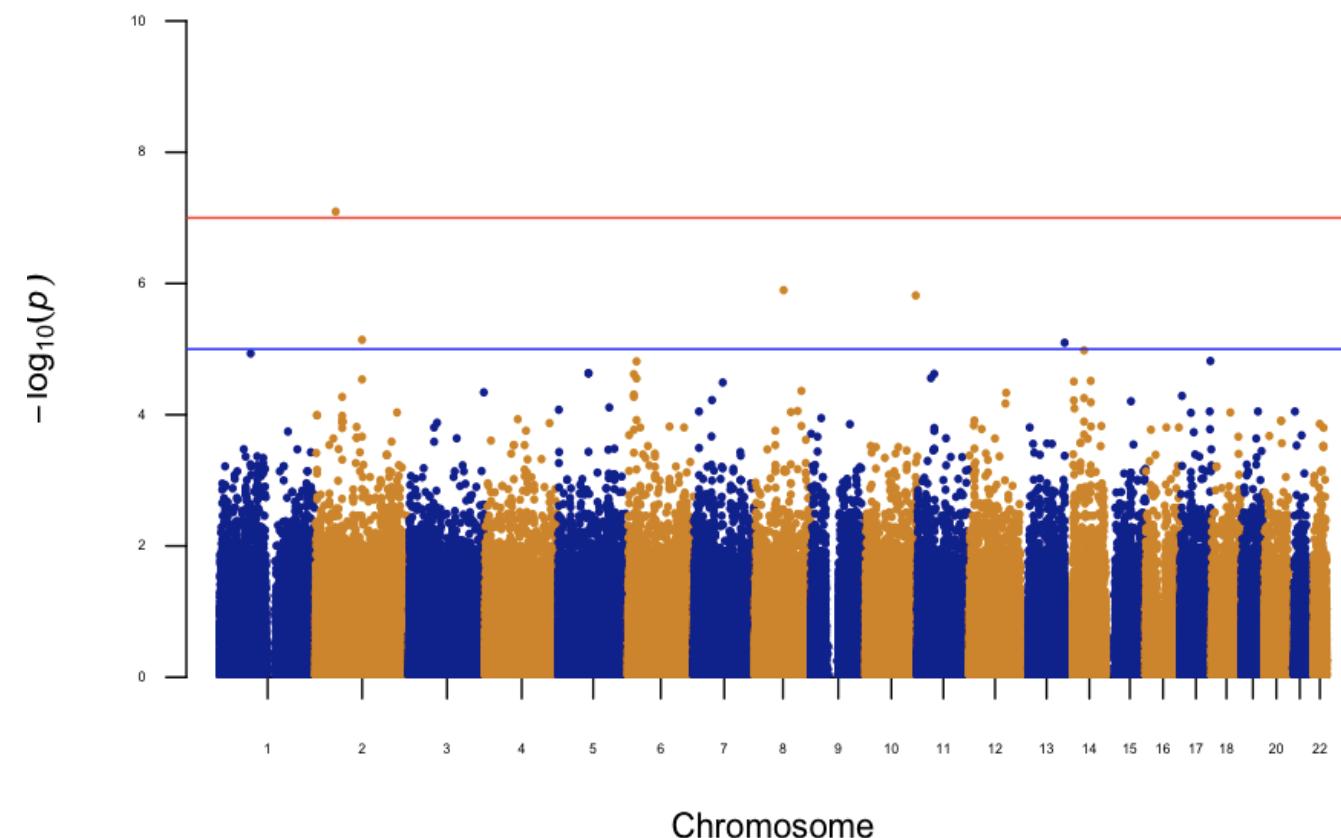
Sulev Koks PhD, MD^{1, 2} , David Wood PhD, MD³, Ene Reimann PhD⁴, Friedemann Awiszus PhD⁵, Christoph H. Lohmann PhD, MD⁵, Jessica Bertrand PhD⁵, Ele Prans PhD⁴, Katre Maasalu PhD, MD^{6, 7}, Aare Märtsom PhD, MD^{6, 7}

Conclusion

Development of the aseptic loosening is associated with several genetic variations and we identified at least four SNPs with a significant effect on the time for loosening. These data could help to develop a personalised approach for TJA and loosening management.

Manhattan plot of the SNP p-values along with genomic coordinates. Blue line designates suggestive association, red line designates genome-wide significance. SNP in the chromosome 2 is associated with the aseptic loosening in genome-wide significance level.

Pool 3 vs pool 1&2+



Lõpetuseks



■ GENERAL ORTHOPAEDICS

Ethical standards for orthopaedic surgeons

Bone Joint J 2014;96-B:1130–2.

M. Benson,
N. Boehler,
M. Szendroi,
L. Zagra,
J. Puget[†]

“...there should be an end to the haphazard way in which new surgical techniques and products are introduced. Patients may be attracted by the latest trend before it has been properly tried and evaluated. The history of Orthopaedics is littered with widely different procedures which have proved of little value”

Tänan!

