

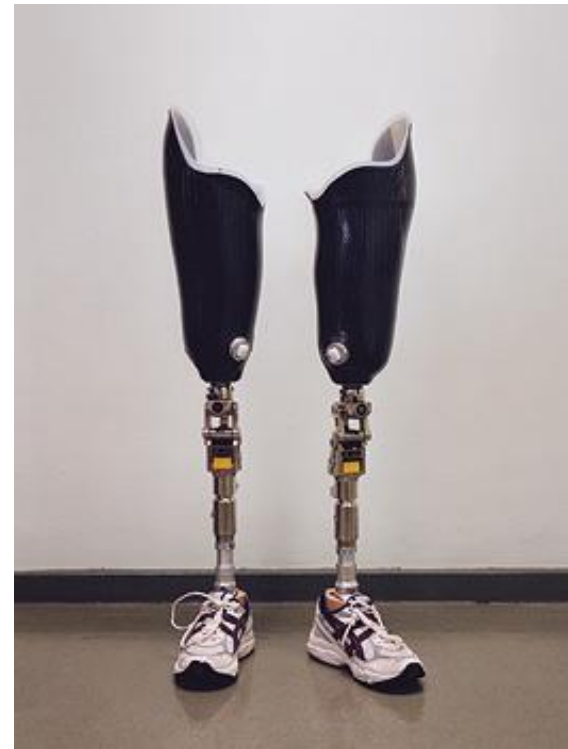
# Meditisiin ja mehhaniseeritud proteesid

Kristel Kosk  
2009

# Millest räägime?

- ▶ Käsi
- ▶ Jalg
- ▶ Silm
- ▶ Kõrv
- ▶ Ajustimulaator
- ▶ Kardial
- ▶ Suguti korgaskeha
- ▶ Süda
- ▶ Maks
- ▶ Kopsud
- ▶ Kõhunäärre
- ▶ Põis
- ▶ (aju, munasarjad)

# Käed ja jalad

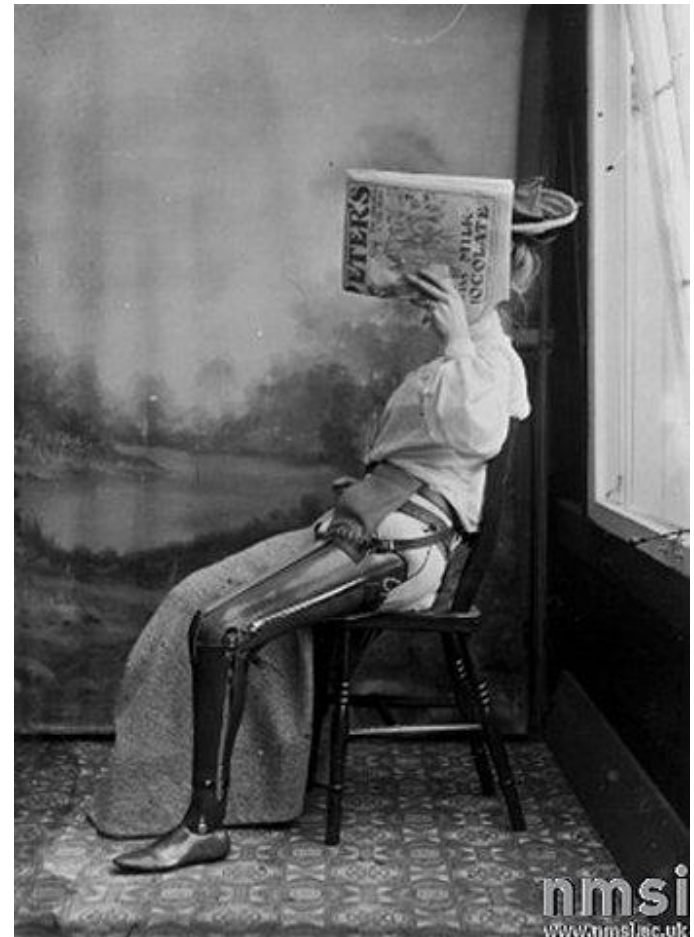


# Ajalugu

- ▶ Rigveda- “raudne jalg” (~1700–1100 eKr)
- ▶ Egiptuse muumia 2 varvast (~1295–664 eKr)
- ▶ Capua jalg (~300 eKr)



- ▶ Metallist jäsemed (15, 16 saj)
- ▶ Puidust jäsemed( 17–19 saj)
- ▶ 1945– Artificial Limb Program
- ▶ J.E. Hanger, D.W. Dorrance

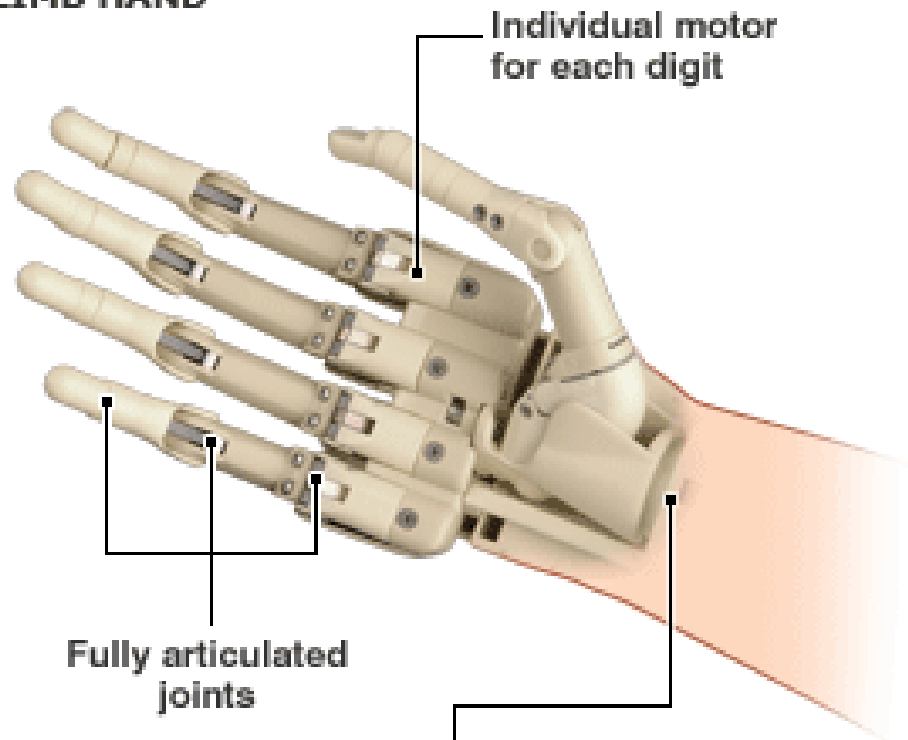


# Tänapäev

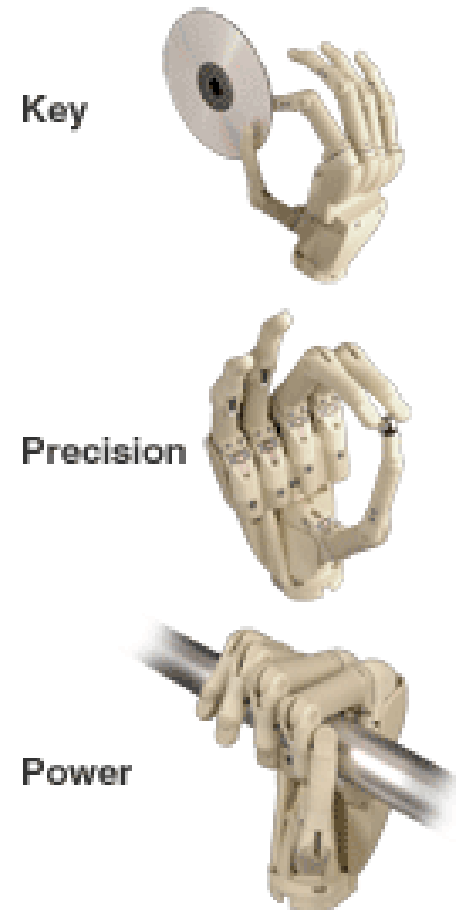
- ▶ Realistlikud- nahasarnane, sarnased funktsioonid
- ▶ Uued materjalid
- ▶ Müelektrilised jäsemed ja arvutid-  
<http://www.youtube.com/watch?v=T6R5bm6qx2E>
- ▶ <http://www.youtube.com/watch?v=jcW5YHKv1h4&feature=related>
- ▶ i-LIMB hand
- ▶ Luu külge ühendamine

# I-Limb

## i-LIMB HAND



## GRIPS



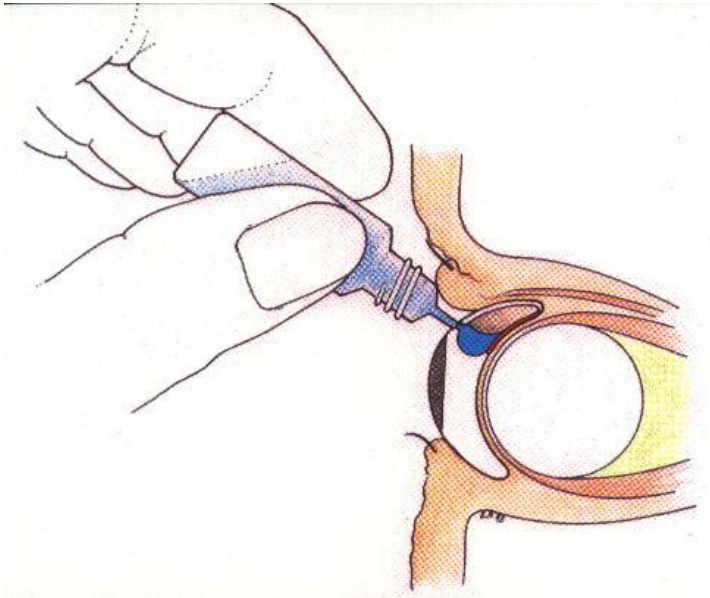
SOURCE: Touch Bionics

# Silm- okulaarsed proteesid

Nn “klaassilm”

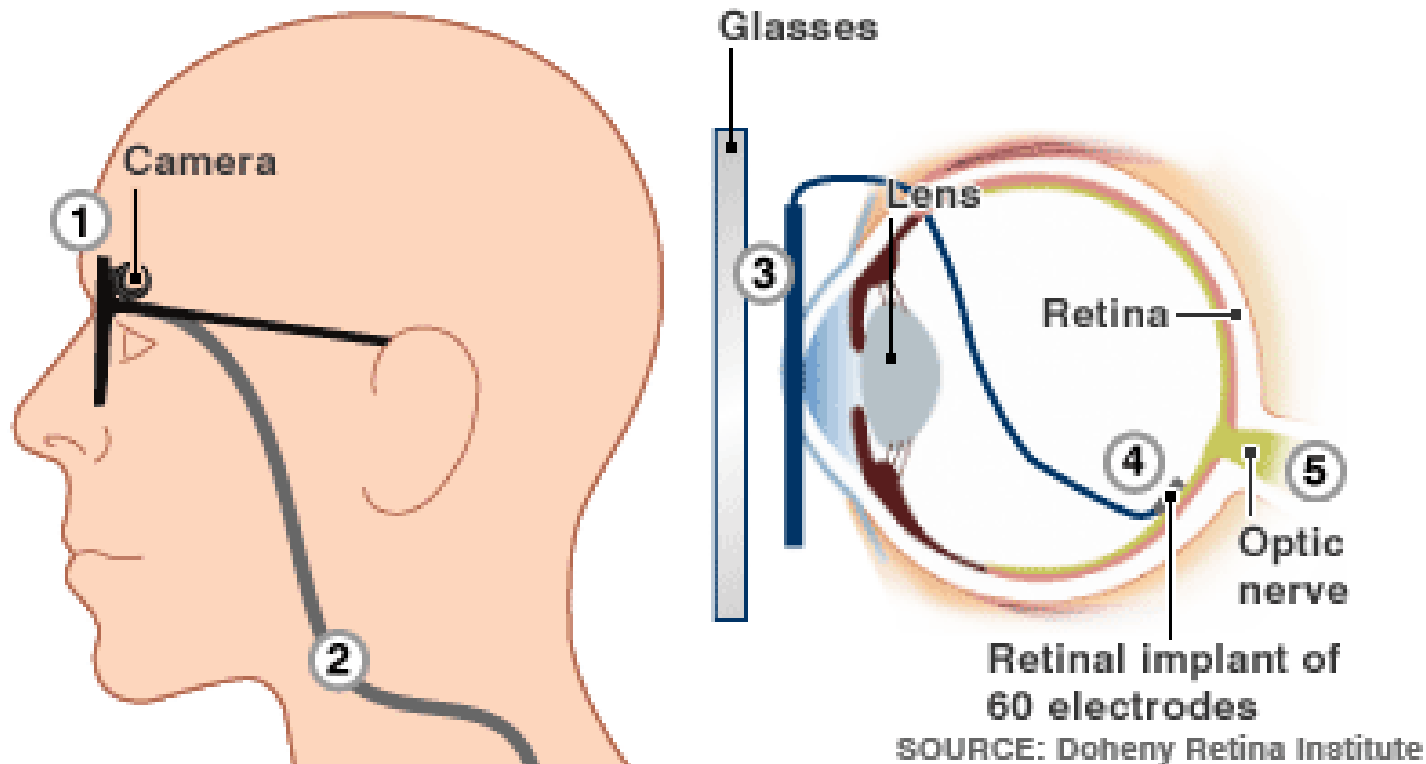
Esteetilised eesmärgid

Akrüül



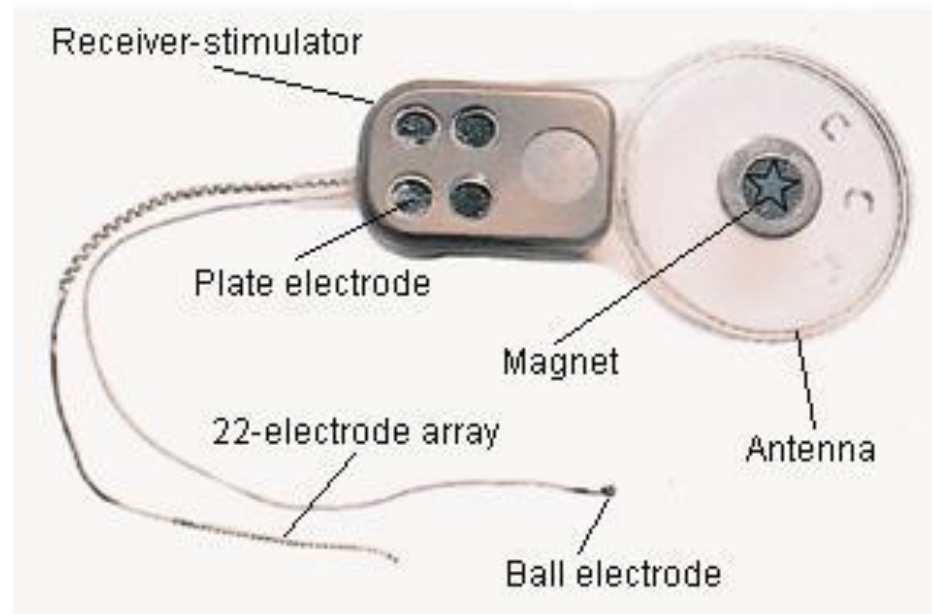
# Silm- visuaalsed proteesid (biooniline silm)

- ▶ Ei ole sama mis silm
- ▶ Tavaliselt kinnitatakse optilise närvi külge
- ▶ U 350 000 kr



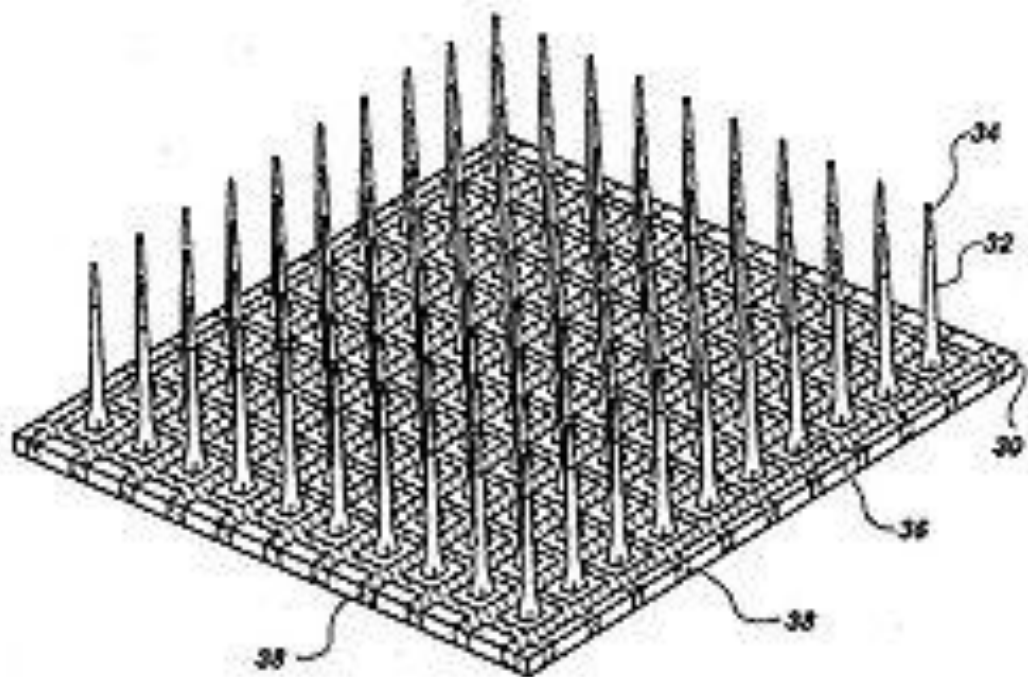
# Kõrv

- ▶ Teoorgan
- ▶ Sisekõrvas või otse närvi küljes
- ▶ Graeme Clark, 1970ndad, Melborne, Austraalia
- ▶ 500 000–1 000 000 kr



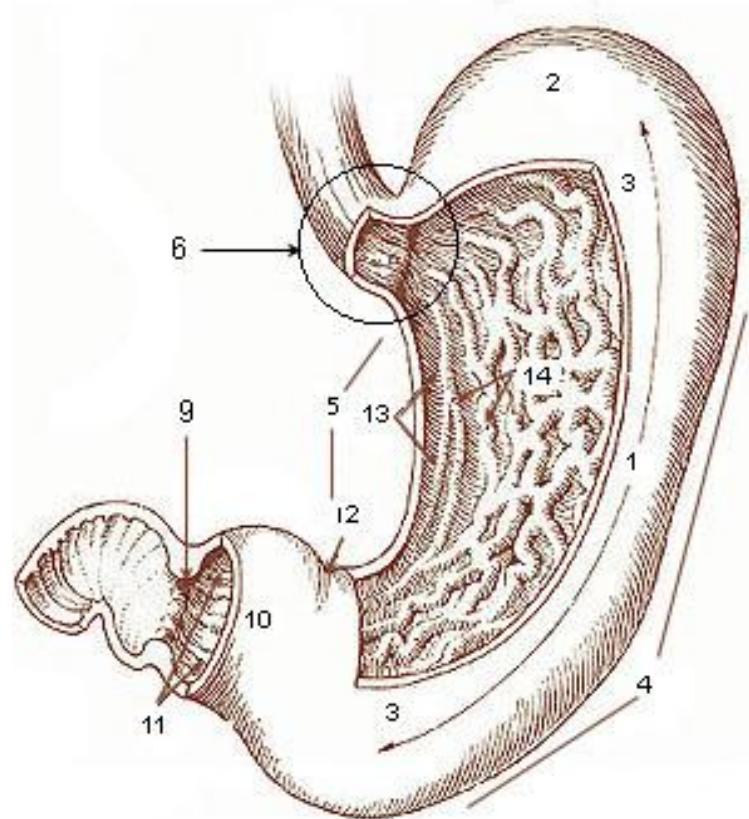
# Ajustimulaator

- ▶ Epilepsia
- ▶ Depressioon
- ▶ Parkinsoni tõbi
- ▶ Tourette sümptom



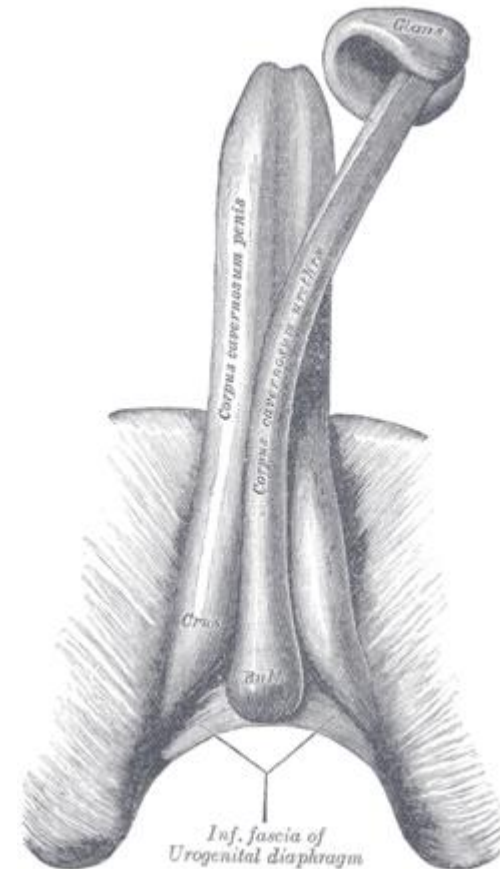
# Kardia

- ▶ Vähk
- ▶ Kõrvetised



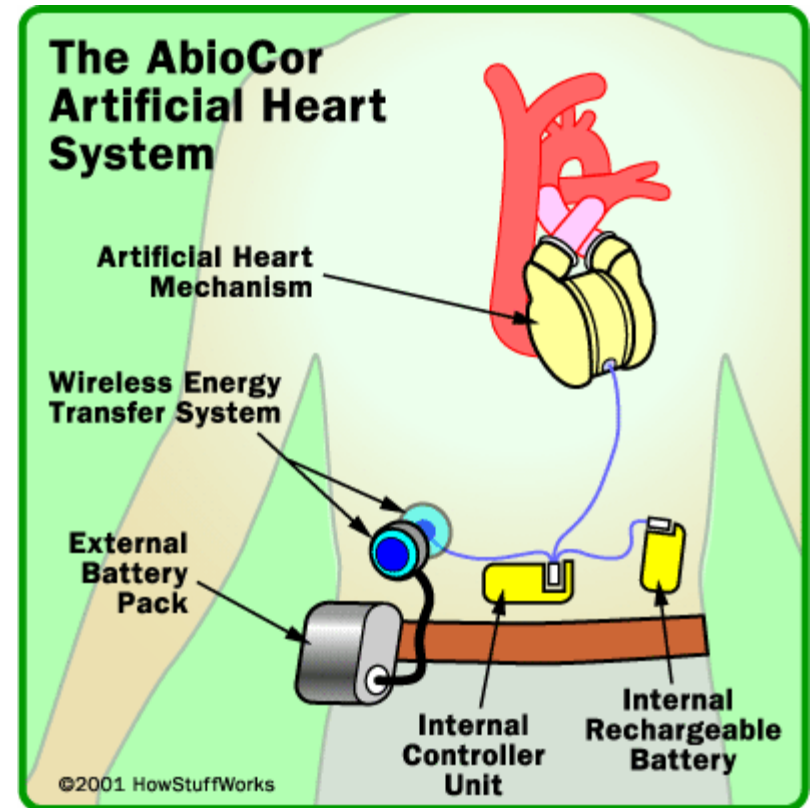
# Suguti korgaskeha

- ▶ Impotents
- ▶ Manuaalselt



# Süda

- ▶ Max 18 kuud
- ▶ U 0,9 kg
- ▶ Operatsioon 7h



- Hüdrauliline pump
- Klapp
- Sisemine ja väline patareid
- Kontroller

# Maks

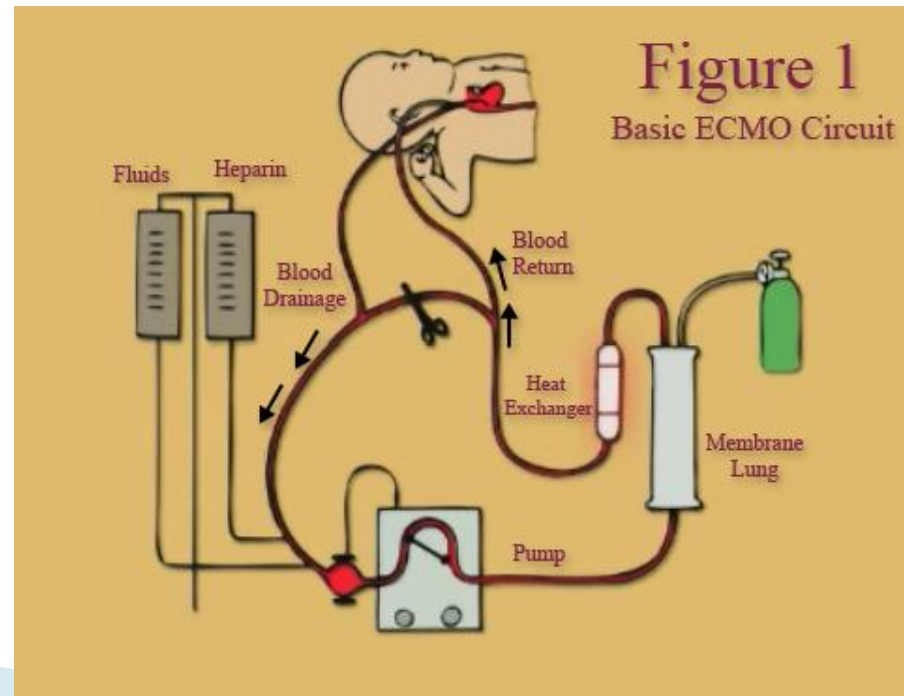
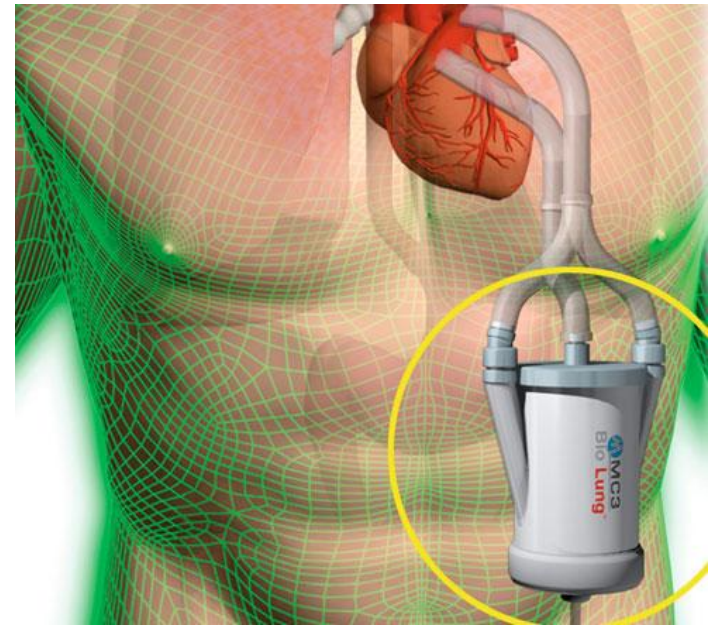
- ▶ Kasvatatakse laboris
- ▶ Tüvirakud nabanöörist
- ▶ Bioreaktor
- ▶ 2006, Newcastle, Inglismaa
- ▶ Nagu dialüüsimasin
- ▶ Kehast väljas
- ▶ Kasutab inimrakke

Nn "bio-maks"

Tehislik

# Kopsud

- ▶ BioLung
- ▶ Kasutab südant
- ▶ Mobiilsus
- ▶ ECMO (Extracorporeal Membrane Oxygenation)
- ▶ Süda + kopsud
- ▶ Kahjustused-  
veritsemine,
- ▶ punased verelibled,
- ▶ ei sobi kõigile



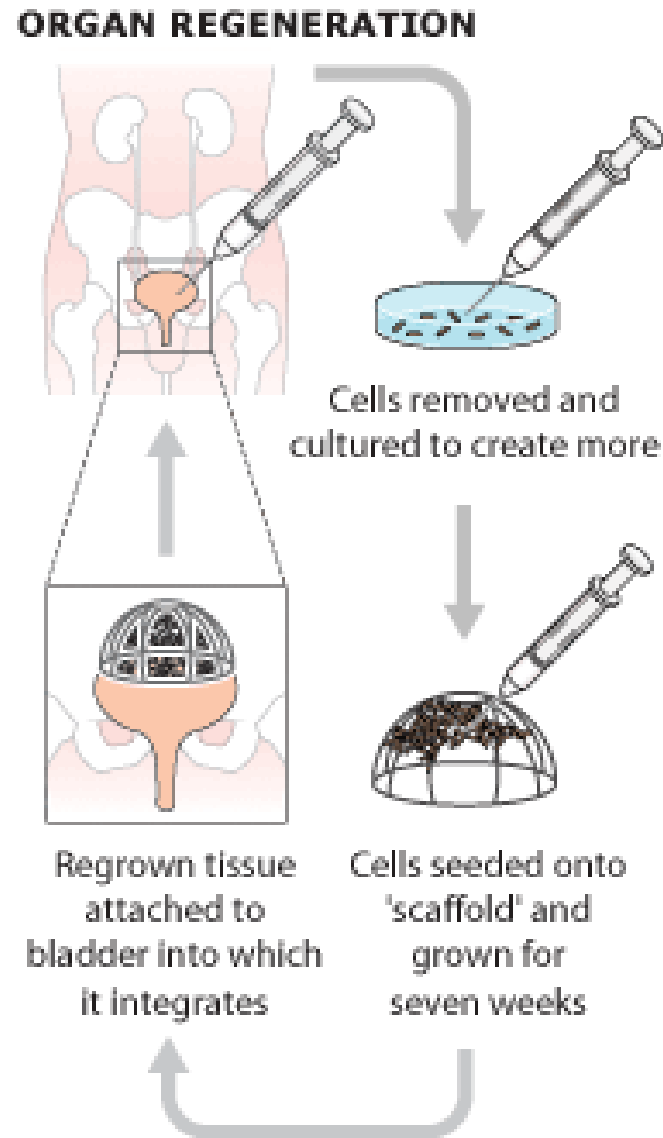
# Pankreas

- ▶ 1. Glükoosi sensor kontrollib veresuhkru taset
- ▶ 2. Arvuti arvutab välja vajaliku insuliinidoosi
- ▶ 3. Insuliinipump eraldab vajaliku doosi



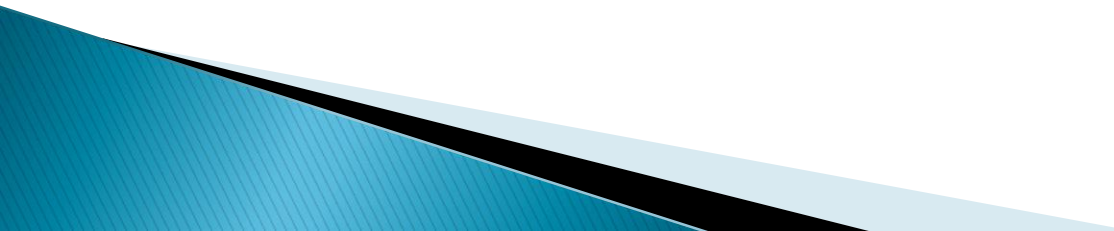
# Põis

- ▶ 2006, Wake Forest University School of Medicine
- ▶ Kasvatatud patsiendi enda põie koest



# Lingid

- ▶ <http://en.wikipedia.org>
- ▶ <http://www.uihealthcare.com/depts/medmuseum/wallexhibits/body/histofpros/histofpros.html>
- ▶ <http://news.nationalgeographic.com/news/2007/07/070727-egypt-toe.html>
- ▶ <http://www.madehow.com/Volume-1/Artificial-Limb.html>
- ▶ <http://artificialretina.energy.gov/howartificialretinaworks.shtml>
- ▶ <http://www.stanford.edu/~palanker/lab/retinalpros.html>
- ▶ <http://news.bbc.co.uk/2/hi/science/nature/6368089.stm>
- ▶ <https://www.arst.ee/et/Uudised-ja-artiklid/26945/biooniline-silm-taastab-nagemise-seni-parimal-voimalikul-moel>
- ▶ <http://www.kidcyber.com.au/topics/bionicear.html>
- ▶ <http://health.howstuffworks.com/artificial-heart.htm>
- ▶ [http://www.livescience.com/health/061031\\_artif\\_liver.html](http://www.livescience.com/health/061031_artif_liver.html)
- ▶ <http://www.msnbc.msn.com/id/28981937/>

- ▶ <http://www.rd.com/living-healthy/medical-breakthrough-artificial-lung/article54667.html>
  - ▶ <http://www.webmd.com/healthy-aging/features/artificial-lung-closer-to-clinical-trial>
  - ▶ <http://news.bbc.co.uk/2/hi/health/6110472.stm>
  - ▶ <http://news.bbc.co.uk/2/hi/health/4871540.stm>
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**Tänan!**