

# Olulisemad mõõdud täiskasvanu kõhu- ja vaagnapiirkonna ultraheliuuringul

Alfred Georg Klamas

I aasta resident

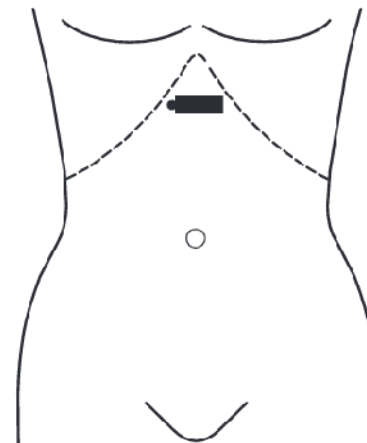
04.01.2023

# Sissejuhatus

- Soovin anda lühiülevaate olulisematest mõõtudest, mis on määratavad täiskasvanute kõhu- ja vaagnapiirkonna ultraheliuuringutel.
- Meetodid (ja normid) võivad erineda.
- Organi või selle osade normaalsed mõõdud ei välista (alati) patoloogiat ja „ebanormaalsed“ mõõdud ei pruugi olla patoloogilised.
- „Maailma kõige ohtlikum inimene on joonlauaga relvastatud radioloog.“

# Pankreas

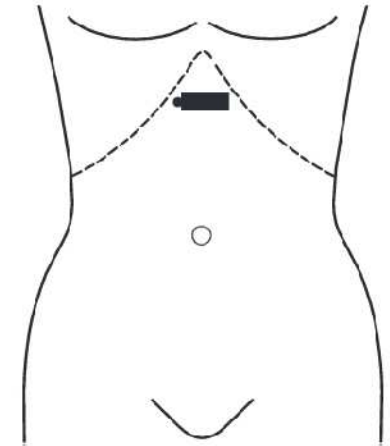
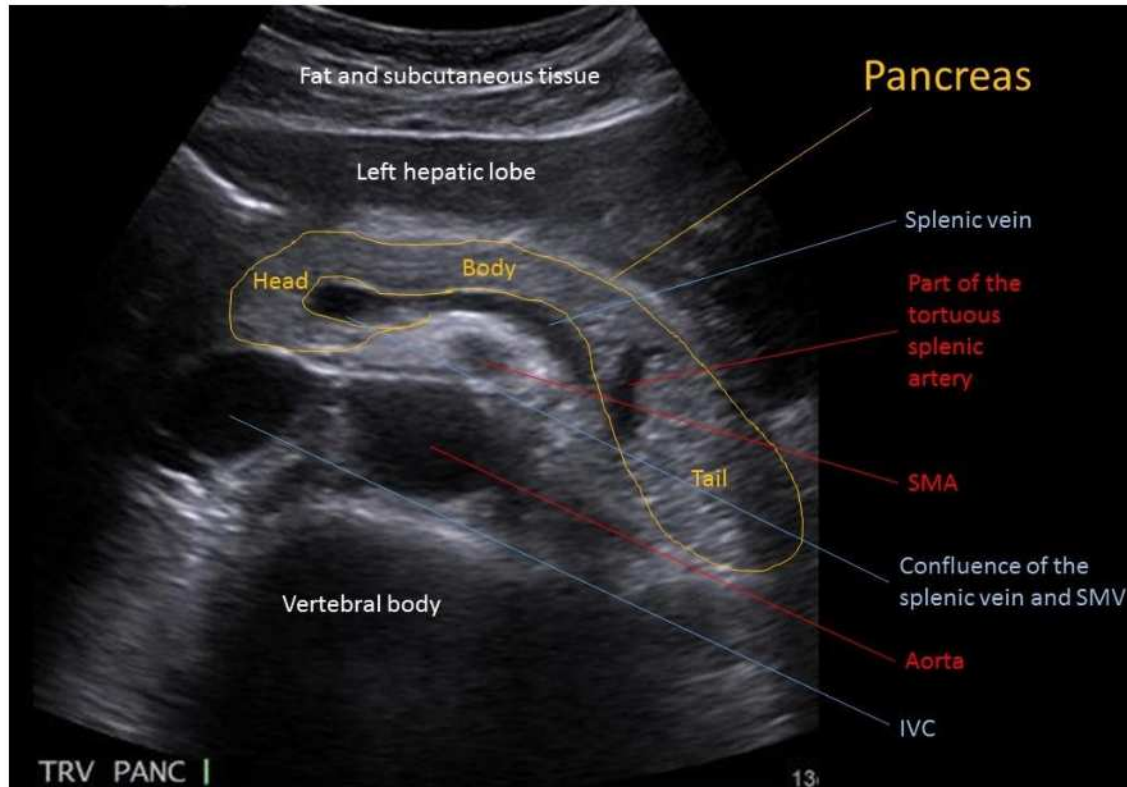
- Kolm osa (AP-mõõt kuni):
  - pea (**34 mm**)
  - keha (**29 mm**)
  - saba (**32 mm**)
- Üldpikkus **12–20 cm**
- Juha laius kuni **3 mm** (k.a)



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

Czarniecki M, Jones J, Murphy A, et al. Pancreatic ultrasound. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022) <https://doi.org/10.53347/rID-27420>

# Pankreas



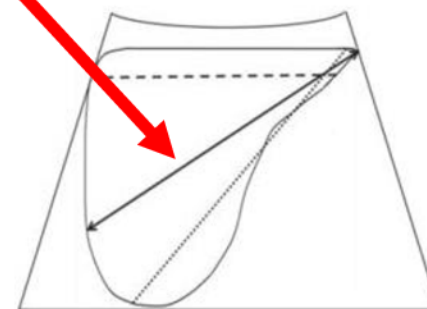
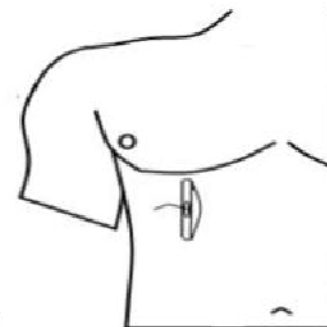
Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

Case courtesy of Matt A. Morgan, Radiopaedia.org, rID: 37581

# Maks

- Kraniokaudaal mõõt medioklavikulaarjoonel keskmiselt 10—12,5 cm; ülempiir **15,5—16 cm**
  - hinnang ei pruugi alati olla objektiivne (eriti suure maksa puhul);
  - vajalik võib olla sügav inspiirium.

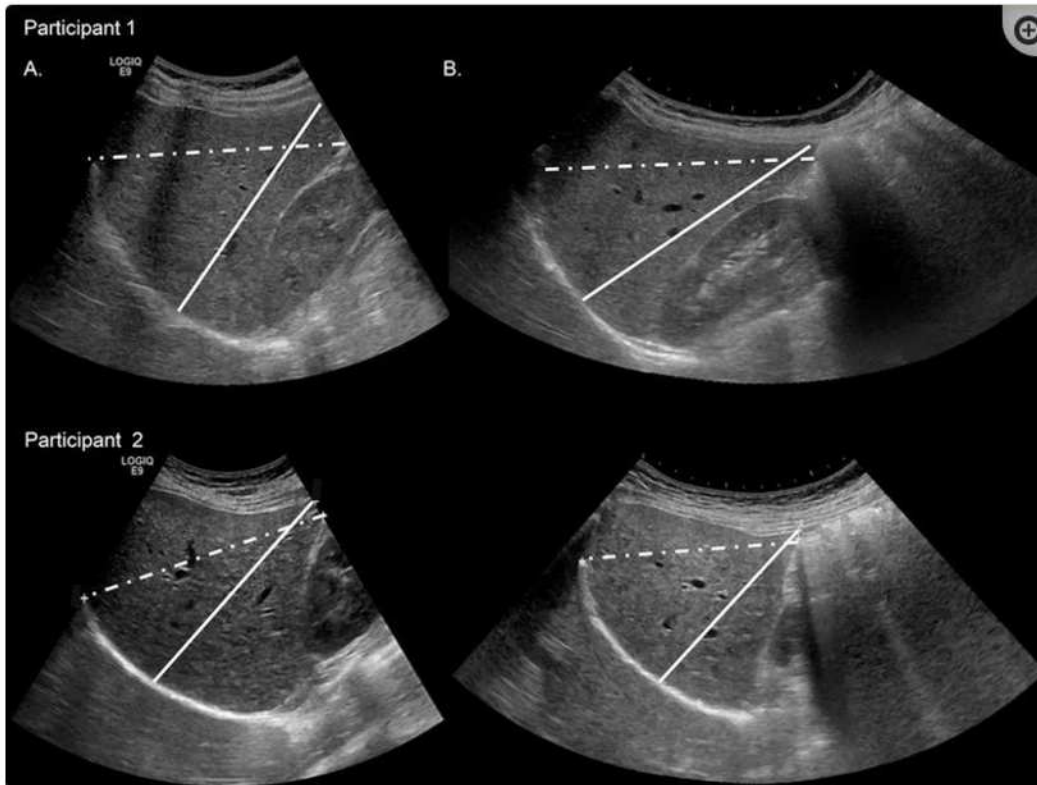
Autorid soovitavad mõõta piki seda joont



Riestra-Candelaria BL et al. Ultrasound Accuracy of Liver Length Measurement with Cadaveric Specimens. J Diagn Med Sonogr. 2016 Jan-Feb;32(1):12-19.

Jones J, Botz B, Bell D, et al. Hepatomegaly. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022) <https://doi.org/10.53347/rID-6213>

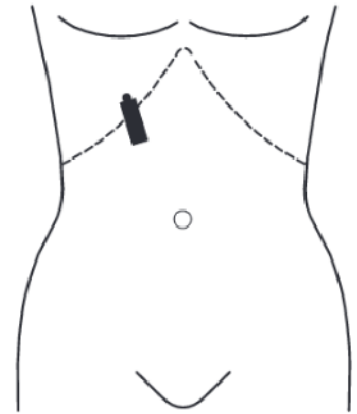
# Maks



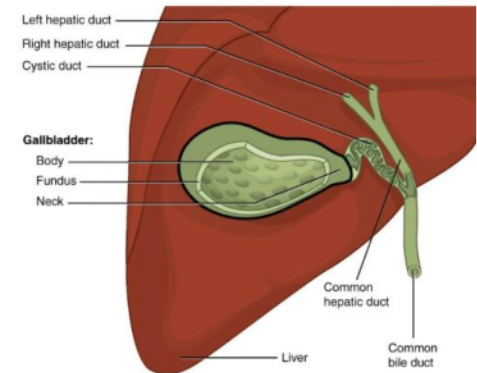
Riestra-Candelaria BL, Rodriguez-Mojica W, Jorge JC. Anatomical criteria to measure the adult right liver lobe by ultrasound. *Sonography*. 2018 Dec;5(4):181-186.

# *Ductus choledochus* (DC) ja *ductus hepaticus communis* (DHC)

- Teatav „segadus“ infos: DC asemel on sageli mõõdetud DHC, lisaks on üle hinnatud koletsüstektoomia ja eaga kaasuvat „normaalset“ juhade laienemist
- Kompromissina DHC valendiku läbimõõduks kuni **7 mm**;
  - koletsüstektoomia kuni **+1 mm**;
  - iga dekaad pärast 60. eluaastat kuni **+0,2 mm** dekaadi kohta

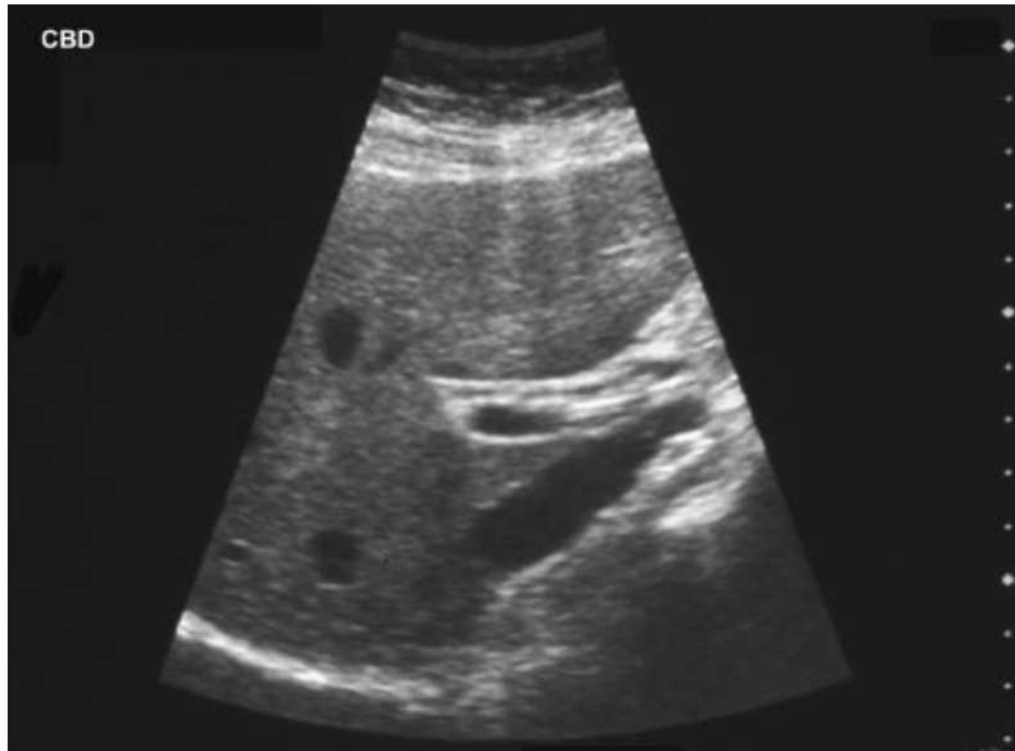
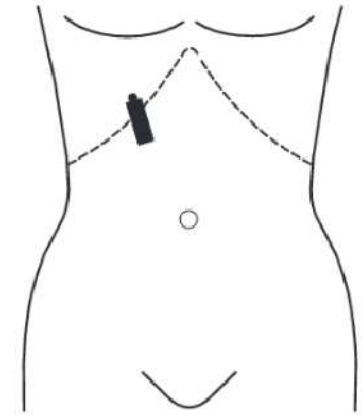


Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

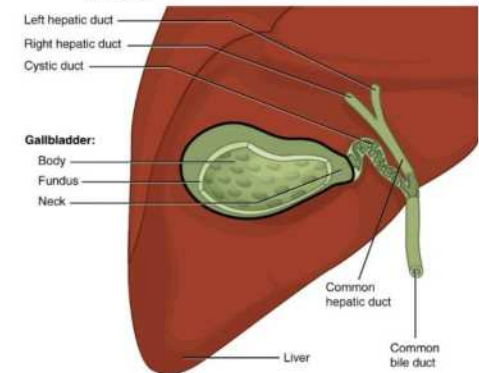


Oh L, Fahrenhorst-Jones T, Chieng R, et al. Common bile duct. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022) <https://doi.org/10.53347/rID-24814>

# Ductus choledochus (DC) ja ductus hepaticus communis (DHC)



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

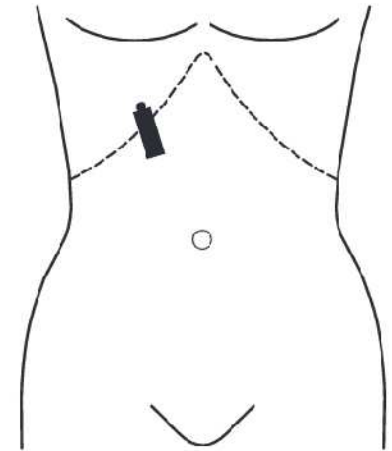
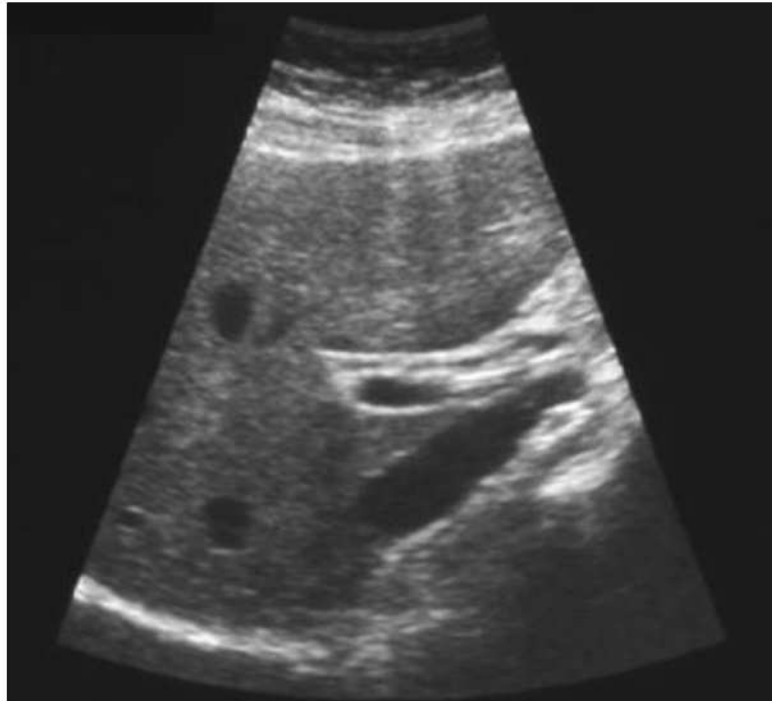


Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.



# Portaalveen

- Maksimaalne diameeter **13 mm**

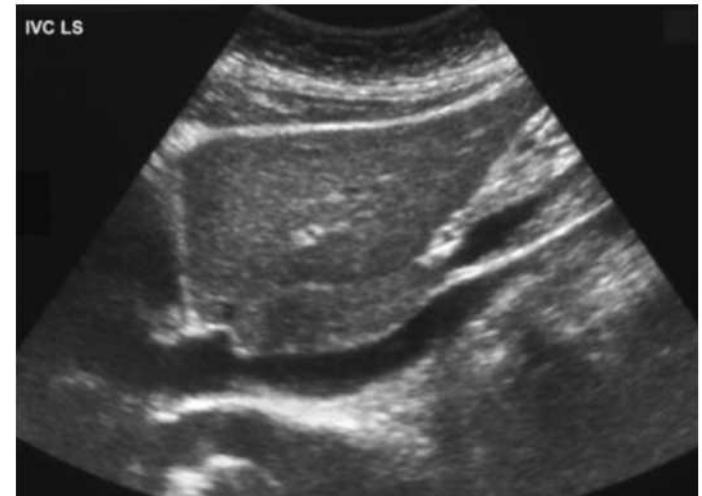
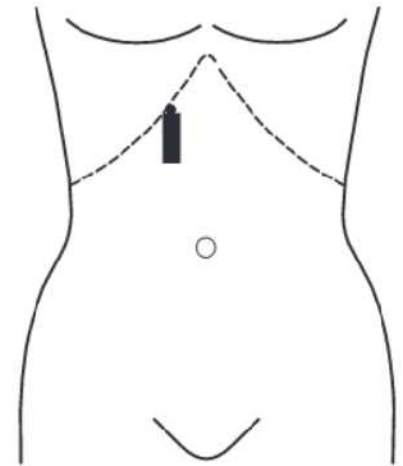


Jones J, Yap J, Yong W, et al. Portal vein. Reference article, Radiopaedia.org (Accessed on 28 Dec 2022) <https://doi.org/10.53347/rID-5732>

Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

# *V. cava inferior*

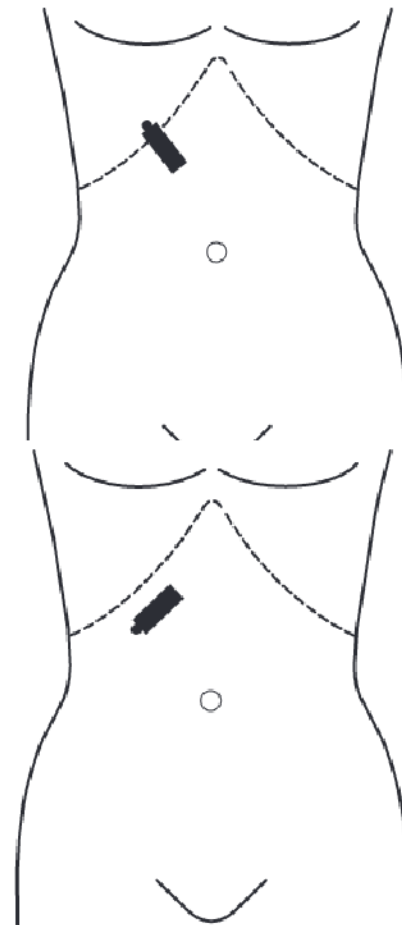
- Kasutusel infusioonravi hindamisel (hetkel sellel pikemalt ei peatu)
- Allikad väidavad erinevat (lisaks sõltub *v. cava inferior*'i diameeter voluumenist)
- Üldiselt võiks diameeter olla ligikaudu **2 cm**



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

# Sapipõis

- Pikkus **7—10 cm** ja laius **3—4 cm**
  - NB! Mõõdud on väga varieeruvad patsientide vahel ja ka samal patsiendil ühe päeva lõikes
- Seina paksus kuni **3 mm**

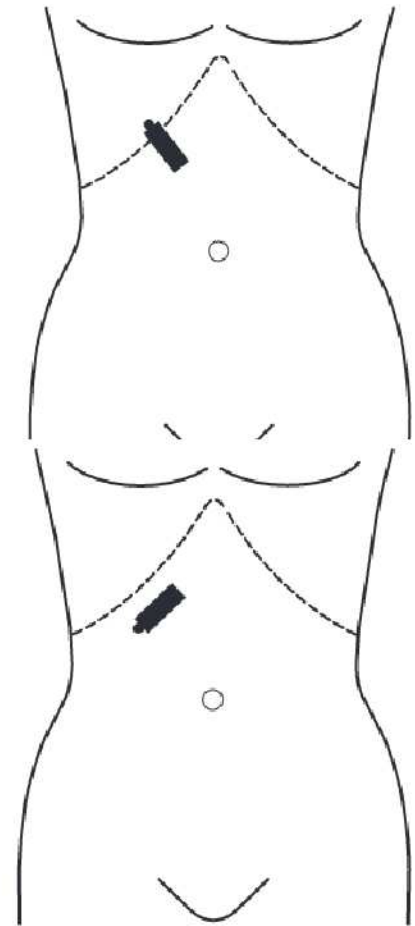


Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

Gaillard F, Hacking C, Knipe H, et al. Gallbladder. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022)  
<https://doi.org/10.53347/rID-12413>

Radswiki T, Neto A, Vadera S, et al. Acute cholecystitis. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022)  
<https://doi.org/10.53347/rID-12084>

# Sapipõis



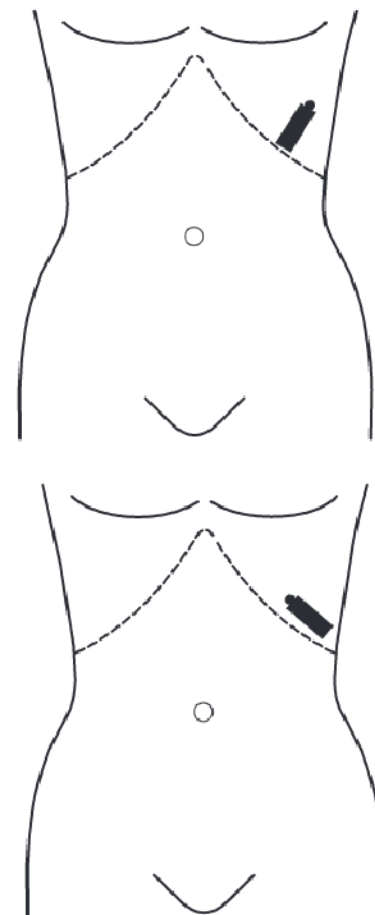
Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

# Põrn

- Suurus varieerub, keskmisteks dimensioonideks 2,5 cm x 7,5 cm x **12(+0,5) cm**.
- Iseloomustatakse põrna ruumalaga:

Põrna ruumala = pikimõõt x paksus  
x laius x 0,52

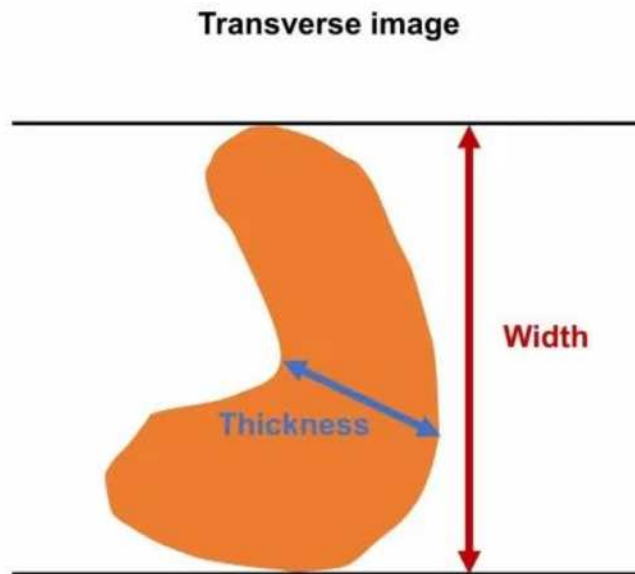
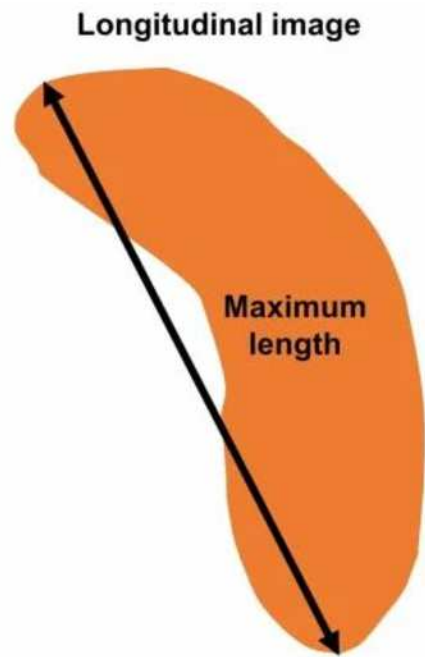
- ühest „normaalset“ ruumala ei ole



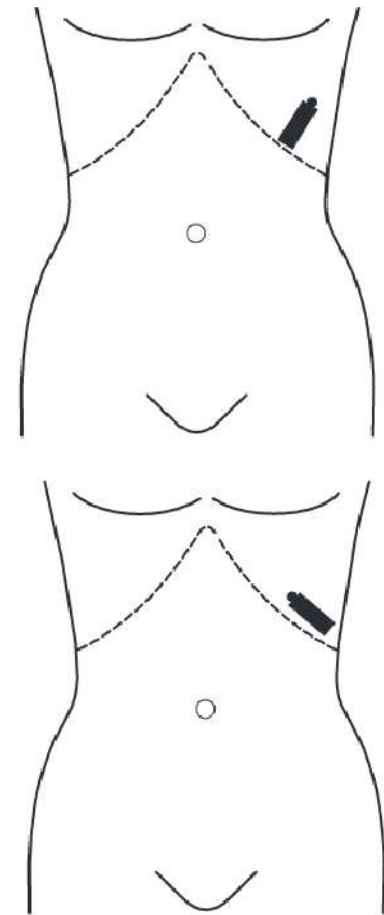
Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

Gaillard F, Niknejad M, Bell D, et al. Splenomegaly. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022) <https://doi.org/10.53347/rID-6003>

# Põrna ruumala



Radcalculators.org



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

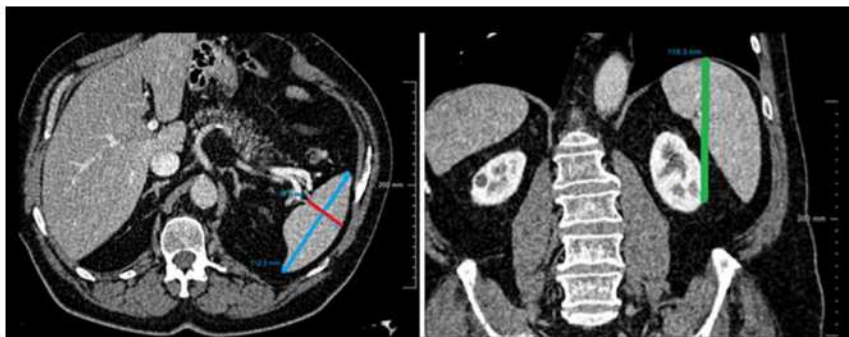
<https://radcalculators.org/spleen-volume-calculator-us/>

# Põrna indeks

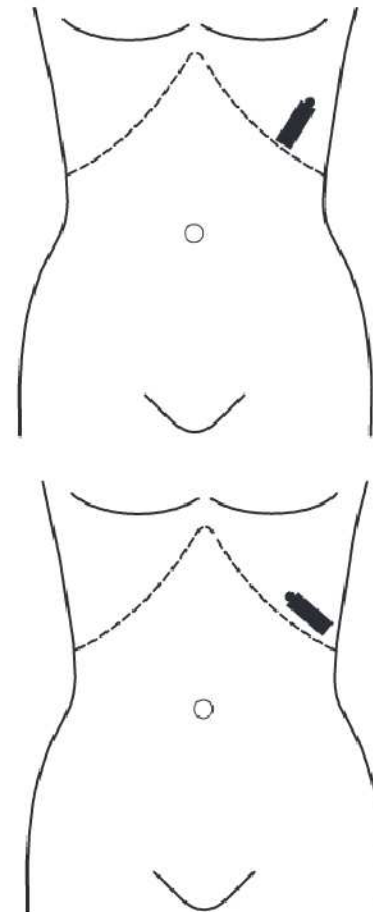
- Allikate järgi pigem KT-l määratav parameeter

$$\text{põrna indeks}^* = \text{pikkus} \times \text{laius} \times \text{paksus}$$

Normi vahemik 120-480



Fully Automatic Volume Measurement of the Spleen at CT Using Deep Learning  
Gabriel E. Humpire-Mamani, Joris Bukala, Ernst T. Scholten, Mathias Prokop, Bram van Ginneken, and Colin Jacobs  
Radiology: Artificial Intelligence 2020 2:4



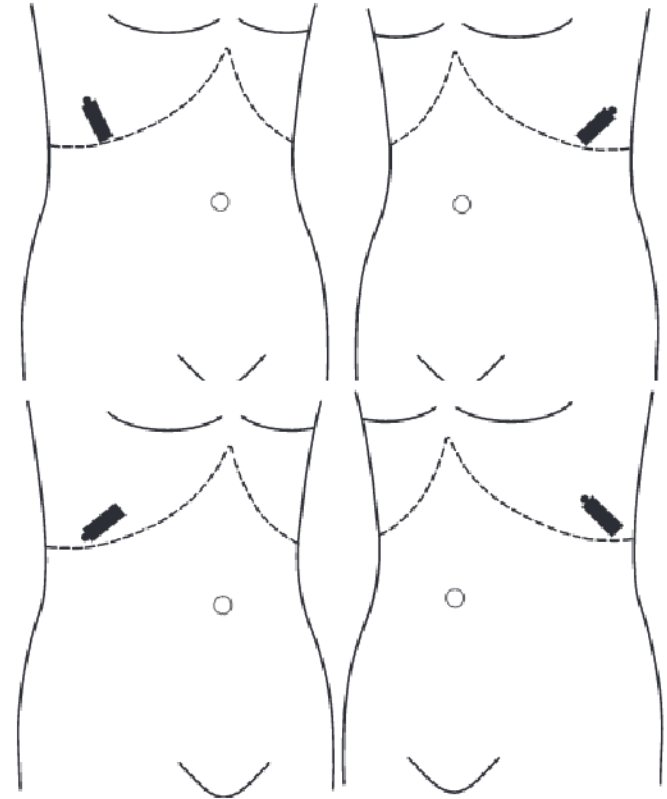
Alty, J. (2013). *Practical ultrasound: An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

Gaillard F, Niknejad M, Bell D, et al. Splenomegaly. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022) <https://doi.org/10.53347/rID-6003>

\*olen kohanud ka valemit: põrna indeks =  $30 + 0,58 \times (\text{pikkus} \times \text{laius} \times \text{paksus})$ , enne toodud „lihtsam“ valem on valdavalt kasutusel

# Neerud

- Pikimõõt **9—14 cm**
- Laius **3—5 cm**
- AP-paksus **3 cm**
- Vasak neer on tavaliselt veidi suurem
- Korteksi paksus **üle 6 mm**
  - alternatiiviks parenhüümi paksus **15—20 mm**

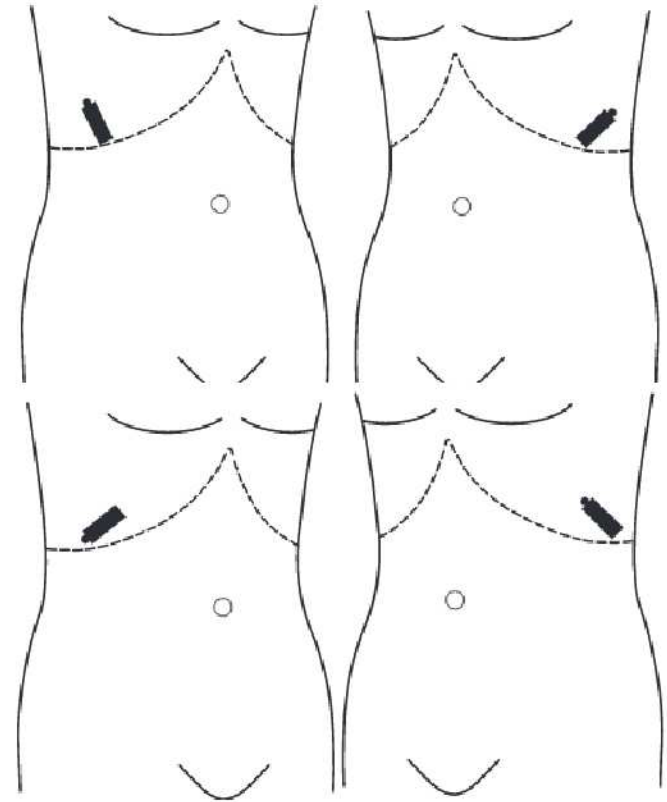
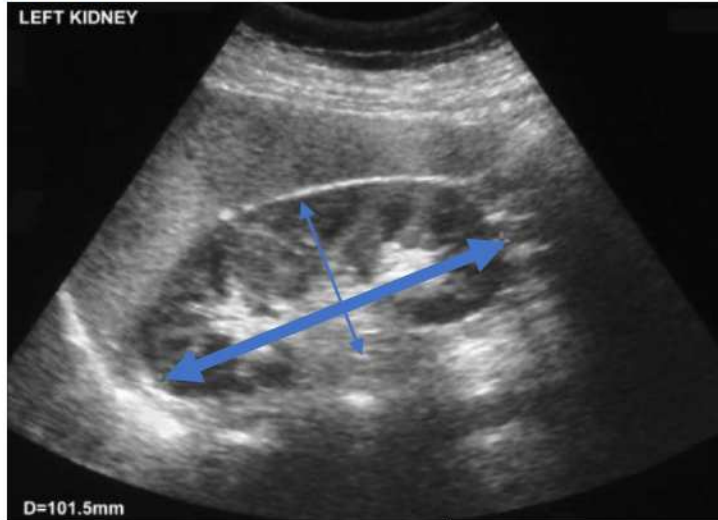


Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

Knipe H, Hacking C, Yap J, et al. Kidneys. Reference article, Radiopaedia.org (Accessed on 27 Dec 2022) <https://doi.org/10.53347/rID-25813>

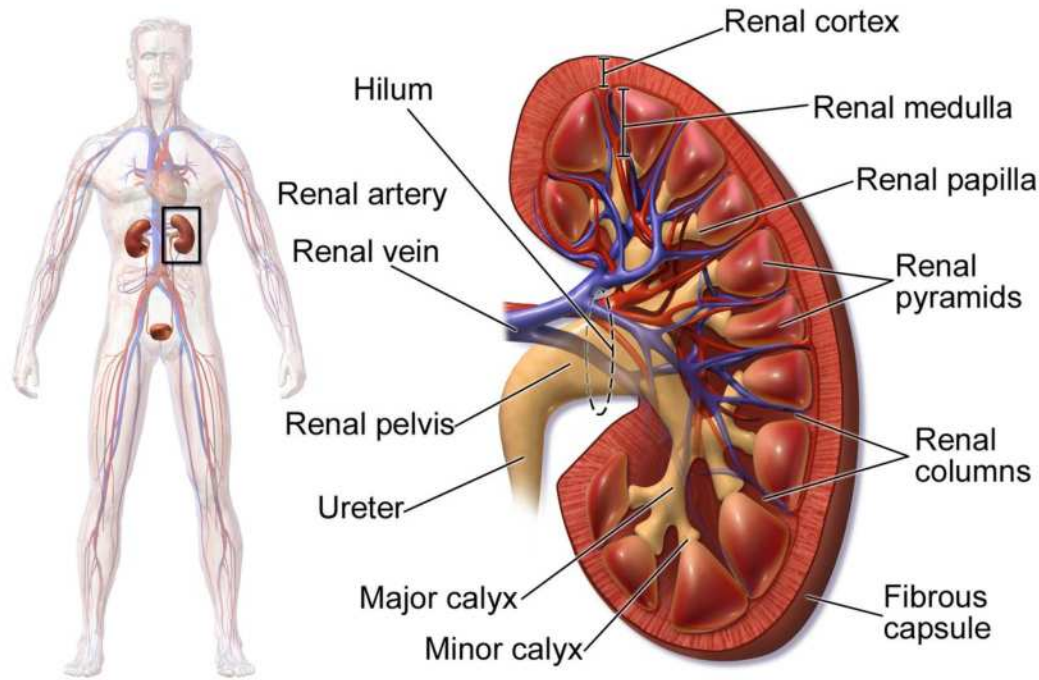


# Neerud



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

# Neeru anatoomia

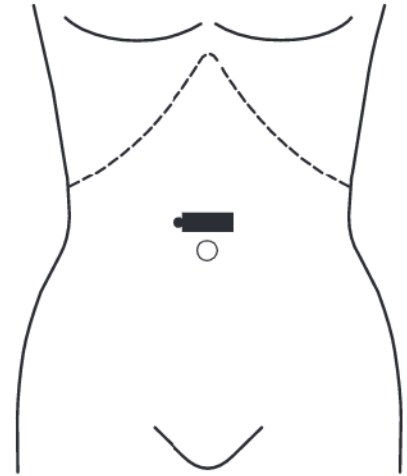


**Kidney Anatomy**

[https://en.wikipedia.org/wiki/Kidney#/media/File:Blausen\\_0592\\_KidneyAnatomy\\_01.png](https://en.wikipedia.org/wiki/Kidney#/media/File:Blausen_0592_KidneyAnatomy_01.png)

# Aordi kõhuosa

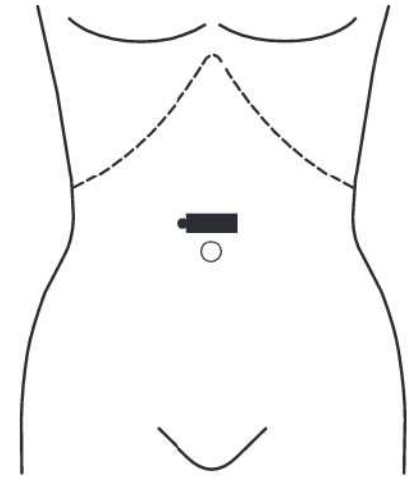
- Mõõtmiseks mitmeid meetodeid: OTO (*outer-to-outer*), ITI (*inner-to-inner*), LELE (*leading edge-to-leading edge*)
- Läbimõõt kuni 3 cm



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

D'Souza D, Niknejad M, Gaillard F, et al. Abdominal aortic aneurysm. Reference article, Radiopaedia.org (Accessed on 28 Dec 2022) <https://doi.org/10.53347/rID-826>

# Aordi kõhuosa



Alty, J. (2013). *Practical ultrasound : An illustrated guide / Jane Alty [and others]*. (2nd ed.). Boca Raton: Taylor & Francis/CRC Press.

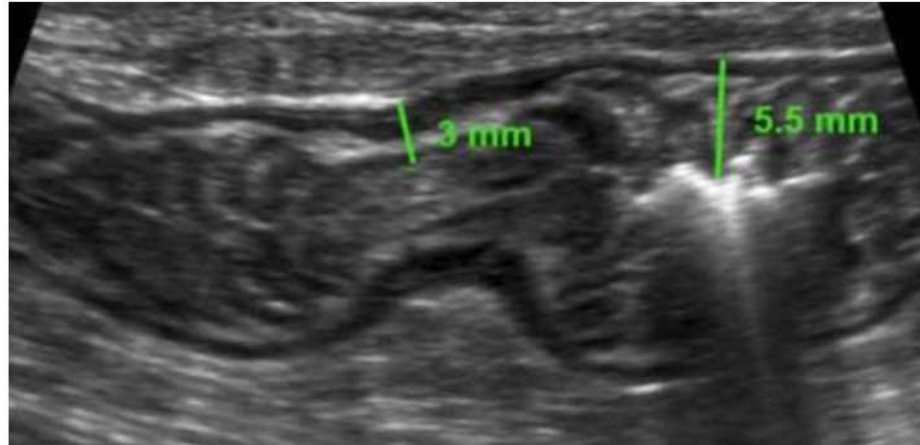
## *A. iliaca communis*

- Meestel diameeter **kuni 17 mm**
  - Naistel diameeter **kuni 15 mm**
- \* *A. iliaca interna* diameeter  
**kuni 8 mm**

# Peensool

- Peensoole seinapaksus kompresioonil võiks jääda vahemikku

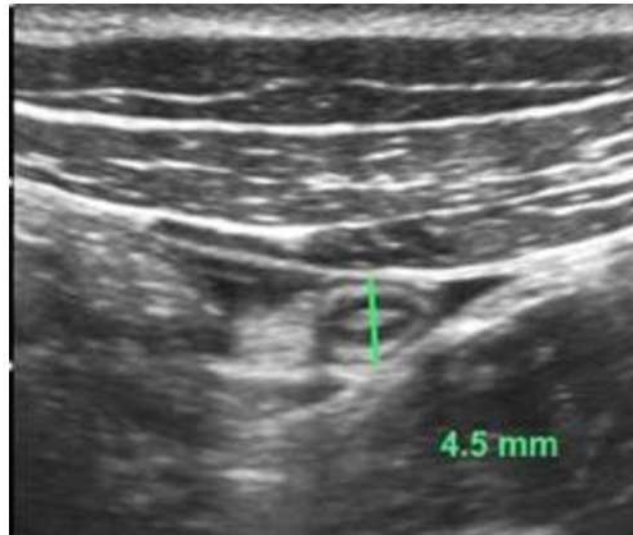
**1,5—2,5 mm (kuni 3 mm)**



[The Radiology Assistant : US of the GI tract - Normal Anatomy](#) (vaadatud 28.12.2022)

# *Appendix vermiformis*

- *Appendix vermiformis*'e diameeter kompressioonil on **~4,5 mm** (**kuni 6 mm**)



[The Radiology Assistant : US of the GI tract - Normal Anatomy](#) (vaadatud 28.12.2022)

Jacob D, Baba Y, Saber M, et al. Acute appendicitis. Reference article, Radiopaedia.org (Accessed on 28 Dec 2022)  
<https://doi.org/10.53347/r1D-922>

# Jämesool

- Jämesoole seinapaksus kompressioonil on **kuni 3 (>4) mm**

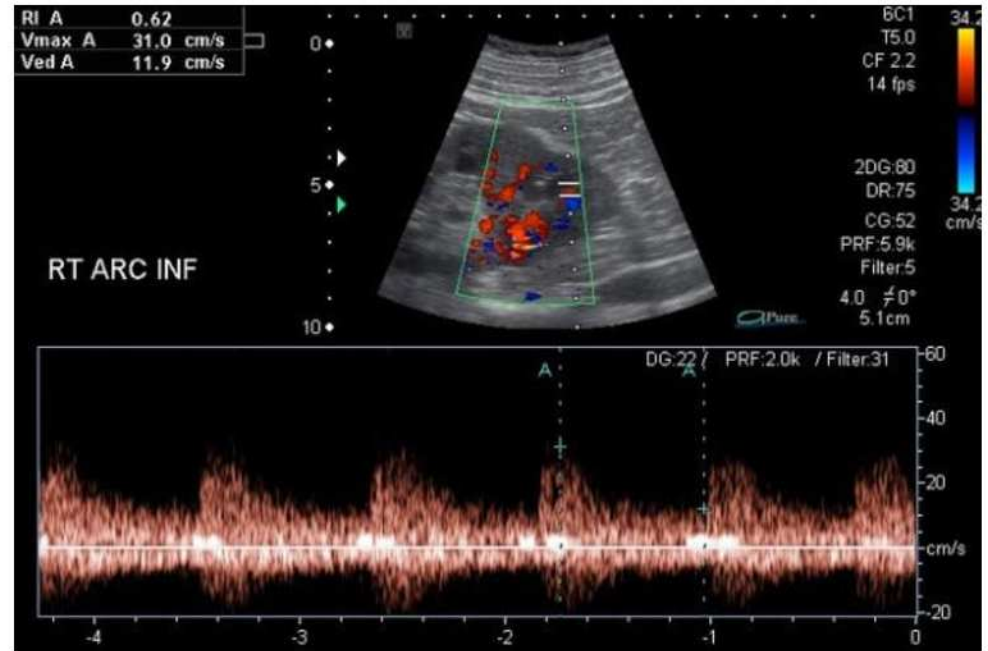


[The Radiology Assistant : US of the GI tract - Normal Anatomy](#) (vaadatud 28.12.2022)



# Lisa 1. Neerusiirik

- Neerusiiriku intrarenaalsete arterite\* resistentsus-indeks peaks olema vahemikus **0,50–0,70**

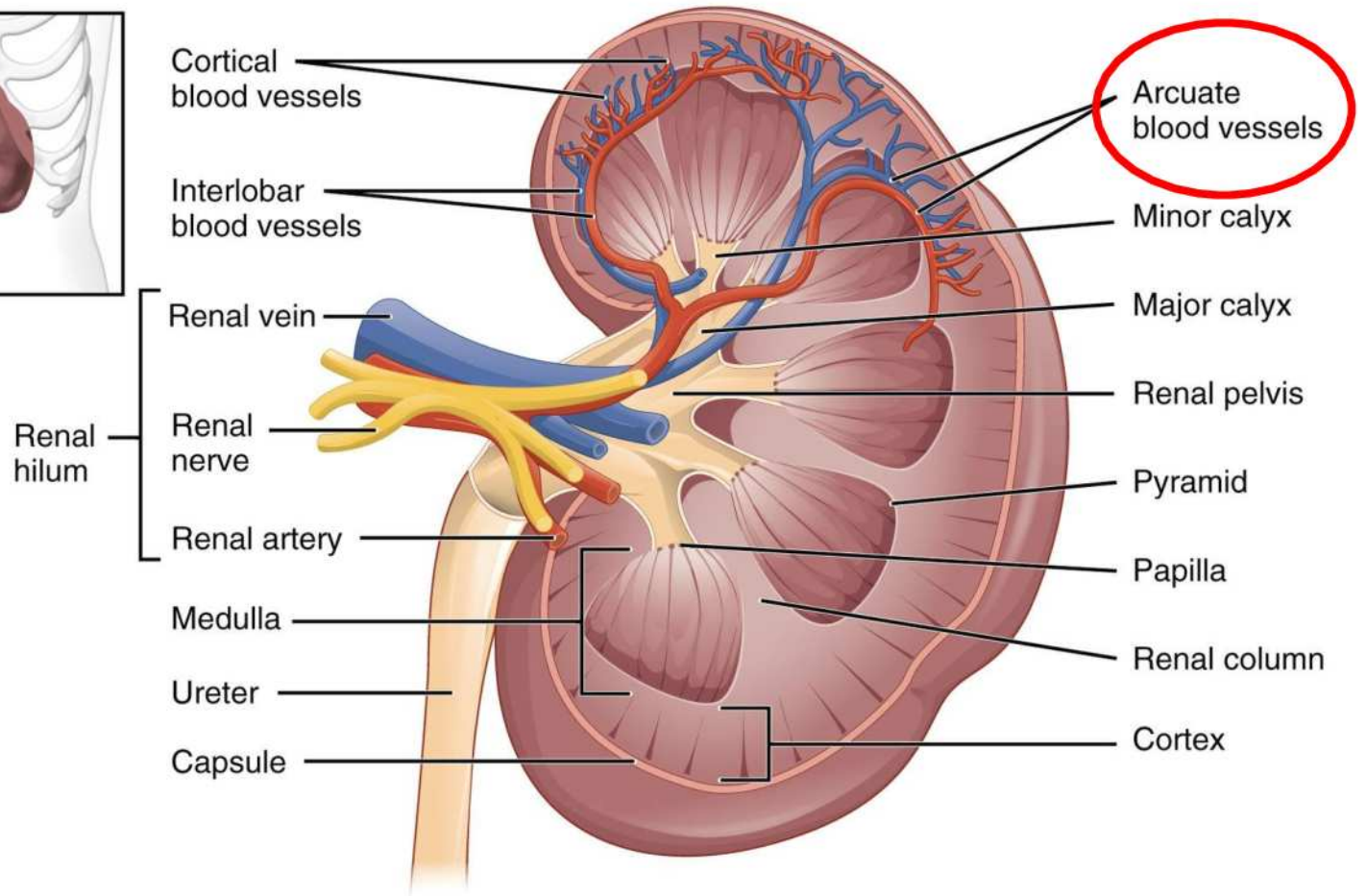
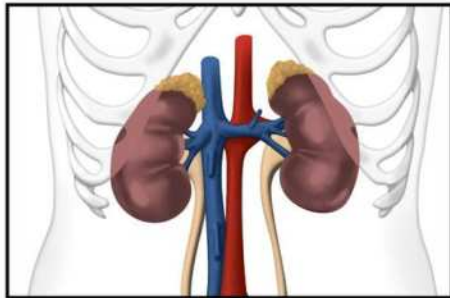


\**aa. arcuatae*'d või interlobaararterid (püramiidide kõrval)

Weerakkody Y, Carroll D, Alsmair A, et al. Renal arterial resistive index. Reference article, Radiopaedia.org (Accessed on 28 Dec 2022) <https://doi.org/10.53347/rID-8643>

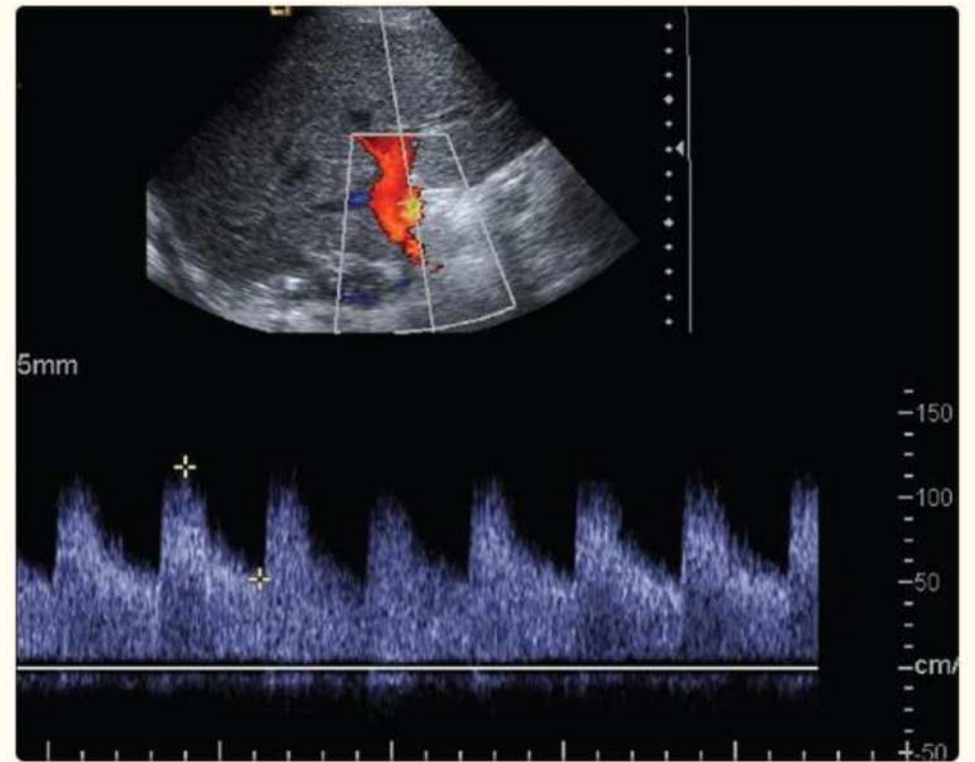
Cullinane B, Renal artery stenosis. Case study, Radiopaedia.org (Accessed on 28 Dec 2022) <https://doi.org/10.53347/rID-14760>

# Neeru verevarustus



# Lisa 2. Maksasiirik

- Vaja hinnata *a. hepatica propria* tüvi ning vasak ja parem haru
- Resistentsus-  
indeksid  
vahemikus  
**0,55—0,80**



Sanyal R, Zarzour JG, Ganeshan DM, Bhargava P, Lall CG, Little MD. Postoperative doppler evaluation of liver transplants. Indian J Radiol Imaging. 2014 Oct;24(4):360-6

# Mõned kasulikud viited

- Arvutamisel abiks RadCalculators:  
<https://radcalculators.org/>
- Kiiresti leitavad mõõdud Radiopaediast rubriigis „Normal radiological reference values“:  
<https://radiopaedia.org/articles/normal-radiological-reference-values>
- Noorematel patsientidel OHSU „Pediatric Radiology Normal Measurements“:  
<https://www.ohsu.edu/school-of-medicine/diagnostic-radiology/pediatric-radiology-normal-measurements>

# Suur aitäh!

Täna dr Kärt Seeri abi eest ettekande koostamisel!