

MEDICAL COLLECTIONS TODAY

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ABSTRACT

In 1890 Professor of Anatomy August Antonius Rauber founded a museum of anatomy at the Old Anatomical Theatre in Tartu (Dorpat) in order to illustrate his lectures and to improve the students' knowledge. As Rauber lectured in German, but most students were Russians, illustrating lectures with models and original specimens was of great significance. Unfortunately, a great number of exhibits of Rauber's museum, although not all, have been lost in wars. In 1999, the institutes moved from the Old and New Anatomical Theatres to the new building of Biomedicum. This, however, could not accommodate the collection of pathological anatomy which had been collected over 200 years, and it remained in the Old Anatomical Theatre. The Club of Friends of the Old Anatomical Theatre succeeded in writing a project to keep the Old Anatomical Theatre and the excellent collection of pathological anatomy alive.

In September 2005, a medical exhibition was opened in the same Old Anatomical Theatre again, now under the name of the Medical Collections of the Faculty of Medicine of the University of Tartu. The exhibition also acquired a number of new functions.

During 2011, the Medical Collections of the Faculty of Medicine cooperated with the Estonian Sports Museum, and the collections were displayed in their exhibition hall.

In 2012, the medical exhibition moved to the premises of the Science Centre AHHAA, and since then, educational programmes have been developed.

Keywords: *medical collection; wet specimen; mummification; anatomical model; skeleton; bones; educational programmes*

In 1890, Professor of Anatomy August Antonius Rauber founded a museum of anatomy at the Old Anatomical Theatre in Tartu (Dorpat) for illustrating his lectures and improving the students' knowledge. As Rauber lectured in German, but most students were Russians, illustrating lectures with models and original specimens was of great significance. Rauber was highly skilled at anatomical preparation, and he also trained the preparator Aleksander Reinvald who was of Estonian ethnicity. Rauber writes, "Since then, the lecture hall has been uninterruptedly teeming with happy life; it has found its rightful place among the students and, in all likelihood, will not disappear from the scene in the future" [1]. Rauber considered the museum most essential for the training of medical students. In the afternoons, after the lectures, the exhibition was open for students of other faculties and townspeople. On Fridays, the exhibition could be visited by housewives.

In his 1895 publication *Über die Einrichtung von Studiensälen in anatomischen Instituten*, Professor Rauber emphasized that people of other specialities should also visit the collections. "The exhibition hall, which entirely lacks the frightening aspect, is appropriate for students of other faculties for acquiring knowledge about their bodies through visualized teaching. If such an exhibition hall is able to exert its positive influence outside the Faculty of Medicine and encourage non-medics to study anatomy, it is, in my opinion, a sufficiently great achievement to justify their foundation at the institutes of anatomy in the future" [1].

Unfortunately, a great number of exhibits of Rauber's museum, although not all, have been lost in the turmoil of wars. In 1999, the Institutes of Anatomy, Histology, Pharmacology, Forensic Medicine and Operative Surgery moved from the Old Anatomical Theatre and the Institutes of Pathological Anatomy and Physiology from the New Anatomical Theatre to the new building of Biomedicum. This, however, could not accommodate the collection of pathological anatomy which had been collected over 200 years, and this remained in the Old Anatomical Theatre. It was taken care of by Aari Talve, Senior Laboratory Assistant of the Institute of Pathological Anatomy and Forensic Medicine. To raise money for the renovation of the Old Anatomical Theatre, which was in bad repair, the people interested in the matter founded the Club of Friends of the Old Anatomical Theatre. A group of club members managed to get money from the Ministry of Education and Research for renovating the preserved medical specimens and preparing them for the exhibition. In September 2005, a medical exhibition was opened in the same Old Anatomical Theatre again, now under the name of the Medical Collections of the Faculty of Medicine of

the University of Tartu. The exhibition also acquired a number of new functions. It became a part of the education system through which school students and adults can learn about the hazards of risk behaviour. Attempts were made to make schoolchildren interested in biology and medicine. The medical exhibition also became a place for self-reflection. The exhibition has also been well received by disabled people, as it gives them strength to cope with their lives. Specimens, models and posters tell the story of the research and discovery of the human organism, which has been increasingly dependent on the development of technology. The exhibits have been of great interest for children and adult artists, and the pictures inspired by the exhibition have been of great interest for visitors.

During 2011, the Medical Collections of the Faculty of Medicine cooperated with the Estonian Sports Museum, and the collections were displayed in their exhibition hall.

In 2012, the medical exhibition moved to the premises of the Science Centre AHHA, and close cooperation with the Centre began. The staff of the medical collections provide explanations on medical specimens and models to visitors and, within their capabilities, participate in AHHA's educational programmes.



Science Centre AHHA

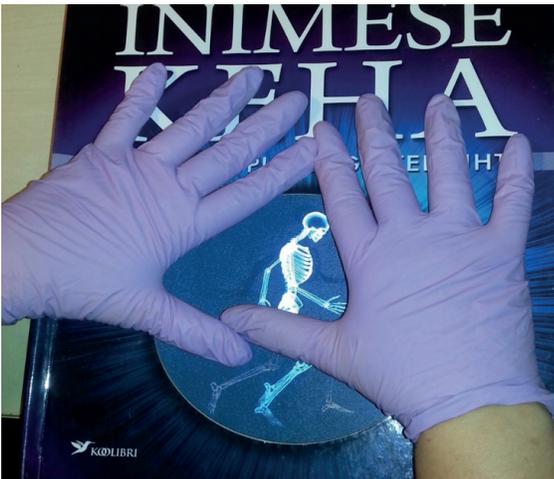
In cooperation with the Estonian National Institute for Health Development and Tartu Department of Social Welfare and Health Care, social advertisements and leaflets have been published that promote healthy ways of life and increase awareness about risk behaviour. The visitors' interest in them is great and the display stands have to be constantly refilled.

At present, the AHHA Science Centre team of educational programmes conductors is headed by Pille Randjärv.



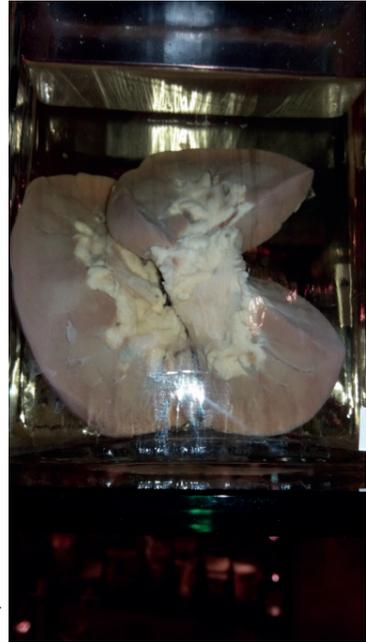
Exhibition of medical collections

Interested young visitors get rubber gloves and can take plastinated specimens in their hands and examine them closely under the supervision of the tour guide. They can get detailed explanations and take a close look at wet specimens in jars.





▲ Plastinated specimen of kidney



Wet specimen of kidney ▶



Plastinated specimen of heart ▲

◀ Wet specimen of obese heart

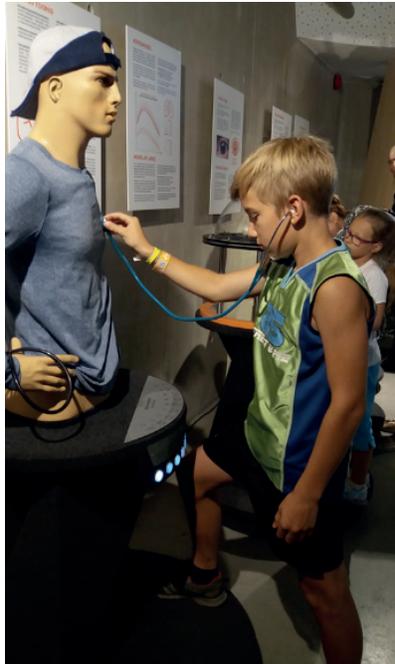


Plastinated pancreas



Human kidney stones

The Science Centre AHHA has provided facilities for showing thematic films and technical equipment for demonstrating the functioning of the human organism to visitors.



KOPSU TOONID

Respiratsioonihaiguste sümptomid
Kõrge häälehelvõnged ja rütmilised muutused võivad viidata hingamisteede haigustele. Hingamisteede haiguste sümptomiteks on ka rütmilised muutused ja kõrge häälehelvõnged.

Vererõhku mõõtmiseks kasutatakse spetsiaalset seadet, mis mõõdab vererõhku. Vererõhku mõõtmiseks kasutatakse spetsiaalset seadet, mis mõõdab vererõhku. Vererõhku mõõtmiseks kasutatakse spetsiaalset seadet, mis mõõdab vererõhku.

Kardiovaskulaarne süsteem on organismi peamine verevarustussüsteem. See koosneb südamest ja veresoontest. Südamest lähevad veresooned kogu organismi, et toimetada rakkudele hapnikku ja toitaineid. Veresooned tagavad ka rakkudele jäätmekärgistamise.

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LUNG (RESPIRATORY) SOUNDS

Normal breath sound (Breathes/Breath)
The respiratory sound is longer and higher than normal breath sound. It is best heard in the neck, back and chest.

Normal breath sound (Breathes)
The respiratory sound is clearly audible, but during the respiratory sound intensity can vary.

Pneumonia is an infection that may affect right or left side of the lung. Pneumonia usually occurs when the immune system is weakened due to changes in the immune system or stress. When the immune system is weakened, a person has difficulty in fighting off the infection.

Bronchitis is an inflammatory disease of the airways and sometimes of bronchi. It is associated with cough, mucus and it usually may vary in severity. It is usually caused by smoking, drinking alcohol and changes the structure of lung tissue.

SÜDAME TOONID

Süda-vereringe
Süda on organismi peamine verevarustussüsteem. See koosneb südamest ja veresoontest. Südamest lähevad veresooned kogu organismi, et toimetada rakkudele hapnikku ja toitaineid. Veresooned tagavad ka rakkudele jäätmekärgistamise.

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HEART SOUNDS

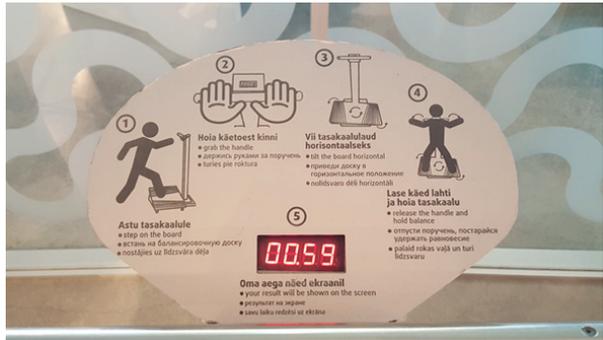
Heart normal heart rate
Heart rate is usually 60-100 beats per minute. It is best heard in the neck, back and chest.

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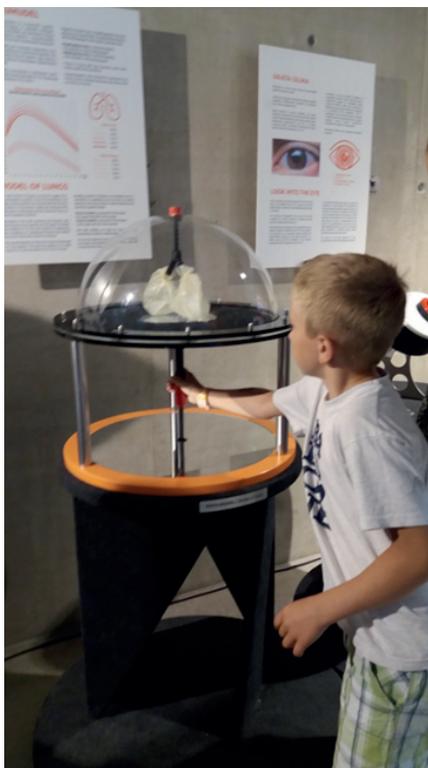
Cardiovascular system is the main system of the body that transports blood and nutrients to the cells of the body. It consists of the heart, blood vessels and lymphatic system.

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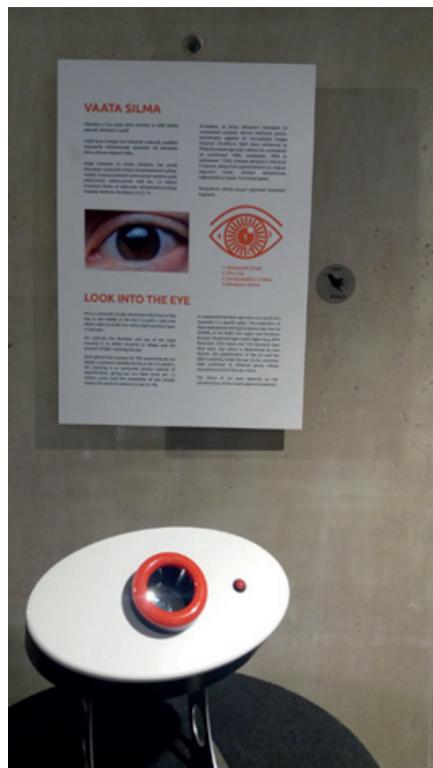
Model for auscultation of the lung and heart sounds. Visitors can also auscultate the lungs of a bronchitis patient and a smoker.



Testing of balance



Explanation of the functioning of the lung



Explanation of the functioning of the eye



Human models are highly popular. They are assembled individually or by families. At weekends queues gather to assemble models under the guidance of the staff.



Human puzzle for children



Muscle puzzle and skeleton puzzle

Human puzzles are assembled attentively. There are simpler and more sophisticated variants of them.

An interesting addition to the exhibition is the AHHAA skeleton camera.

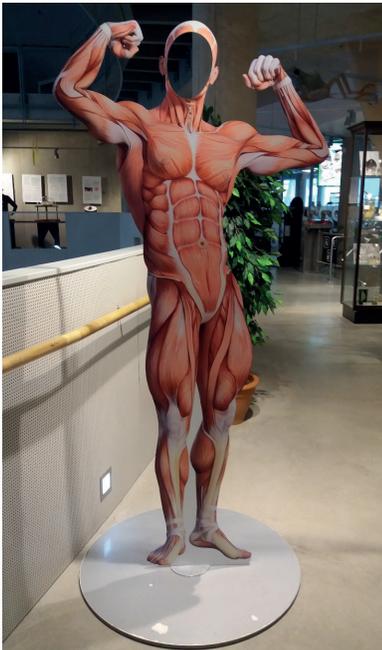


School students can participate in the educational programme "The Human".

The educational programmes for schoolchildren are directed by Pille Randjärv. After the tour of medical collections, students can solve tasks.



Tasks for investigation of oneself.



Muscleman anatomical model

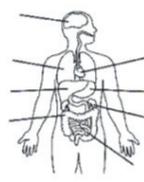


ORGANID

Teostamise koht: tehnoloogia saal, meditsiinikolleksioonid

Pane õigesti kokku inimese medeli siseorganid.

➤ Märgi joonisele, millised organid on inimeses?



➤ Vali 3 organit ja kirjuta juurde nende rütmilised inimestas?

- _____
- _____
- _____





AHHA-ÕPE: INEMINE

HEIGHT OF THE BODY

Location of the task: medical collections (hallway)

Required material: measuring tape, model of the skeleton, written information on the table next to the collection

Preparation:

The longest bone of the skeleton is femur (thigh bone), reaching from the knee to the hip. It is also the heaviest and strongest bone. Femur is usually 37-45 cm long and makes up a quarter (one fourth) of our body height.

Source: www.miskoke.ee



Look at the skeleton and find the corresponding points on your own body, so that you could start taking the measures

Name	Length of femur (cm)	Body height (cm)	Your body height equals ... (number of) femurs

The average length of a femur in our team is _____ cm

We find this proposition to be eruväärne (correct/incorrect)

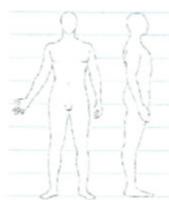


AHHA-ÕPE: INEMINE

BODY HEAT

Location of the task: Hall of Technology (great hall), Thermal camera

Use the thermal camera to find out how heat is distributed in your body. Find the warmest parts of your body and mark them on the scheme below, using the corresponding colours. Then find the „coldest“ parts of your body and mark them on the drawing as well.



➤ Find at least three ways how to maintain your body heat in winter - and stay stylish at the same time!

- ✓ _____
- ✓ _____
- ✓ _____

➤ Why is it necessary to keep these parts of the body warm in cold weather?



AHHA-ÕPE: INEMINE

KOPSUD

Teostamise koht: tehnoloogia saal, www.miskoke.ee

Leia meditsiinikolleksioonist õies kopsude vibrin.

➤ Miks on ühe vilja paisud kopsudest kaetud sõrve tipptiiviga (müstid täpsikesed)?

➤ Miks on üks osa kopsutorustus lehtlaid sõrved ja teine osa püstsed?

➤ Milliseid ülesandeid täidavad kopsud meie kehas? Nimeta vähemalt 3.

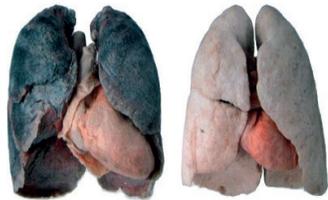
- _____
- _____
- _____



➤ Kumb kopsudest on tavaliselt väiksem? Põhjendage.



This is followed by a practical workshop in the laboratory where a pig's lung or a pig's heart is dissected. The teacher explains in detail the structure and functioning principles of the selected organ. All children are provided with protective clothing and rubber gloves.



The structure of the lung is explained.

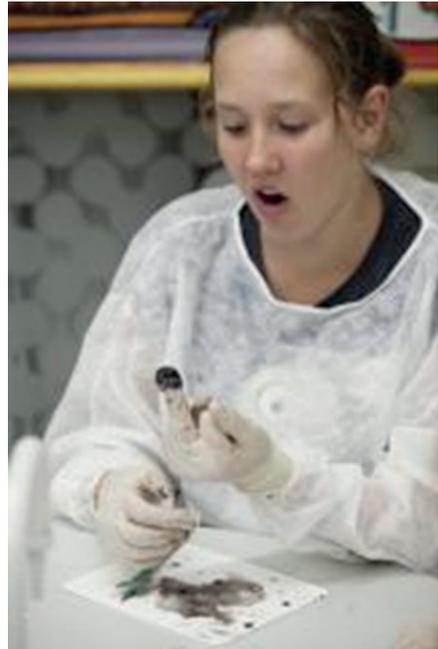


▲ Blowing air into the lung

◀ Dissection of the pig's lung



Dissection of the pig's eye



The AHHA effect – a moment of discovery and surprise – is always present. ▶

The day also includes AHHA science theatre. Depending on the age of students, science theatre programmes are performed: “From Cake to Poop”. In the science theatre, one can learn about the human being’s digestion.



Science theatre performance “From Cake to Poop”

The study day ends with a summing-up where participants can point out what they personally learned on that day or what was new for them.

This is me!

Name _____

Gender Male Female

Age _____

Hair color Red Orange Yellow Green Blue Purple Grey Black

Eye color Blue Green Yellow Orange Red Grey Black

Color of my skin Red Orange Yellow Green Blue Purple Grey Black

Height _____

Weight _____

Distinguishing marks _____

Fingerprint _____

Shoe size _____

Clear your photo here _____

1. LUNGS

We breathe in oxygen every day. Breathing provides us with the air required to sustain life and remove carbon dioxide from our bodies. On average, we inhale half litres of air with every breath.

2. KIDNEYS

The kidneys remove toxic wastes from our bodies. They regulate the salt and water balance in our bodies. About 1 litre of blood is filtered every minute.

3. HEART

The function of your heart is to pump the blood around, providing your body with oxygen and nutrients. Your heart weighs 300g and is about the size of your fist.

4. STOMACH

Put a finger on your wrist - the pulse you feel indicates your heart rate.

5. LIVER

Count the number of your blood platelets in one minute. How many out of 100,000 could appear in the number different now?

6. PANCREAS

Your spleen plays a vital part in the immune system. It is the 'chemical plant' of your body, removing old or damaged red blood cells.

7. SMALL INTESTINE

After chewing and swallowing, food passes through the oesophagus to the stomach. Everything you swallow ends up in your stomach, where food can be broken down and mixed with gastric acids.

8. LARGE INTESTINE

Upper gastric digestion finally, then passes from stomach to the small intestine, to long and highly convoluted tube, where nutrients are absorbed into the bloodstream. The large intestine absorbs water from the liquid that passes on to the rectum.

AHHA

Young children have also been taught with worksheets (see below) and human models only. Worksheets are popular with adult visitors as well. They have been compiled in the languages of the main visitor groups: Estonian, Russian, English, Latvian and Lithuanian. Worksheets in Finnish are in preparation.

The medical collections are always busy, as the AHHA Science Centre is a popular place. Last year, the Centre had 226,000 visitors from the whole world. We have fans from several countries who visit us recurrently and bring along new friends. It is sheer joy for the staff of the collections if visitors come to the medical collections repeatedly during the day and always ask new questions, as this shows that people are interested. If the advice has been helpful, they come and express their thanks.



When the wonder how children come to this world has been understood, one can take a peaceful rest in the mother's womb created by the artist Kristiina Viin.

As the medical collections lack base funding, thematic souvenirs are sold to purchase materials necessary for taking care of the collections.

In conclusion, it can be said that in the 21st century the study hall that initially was meant to illustrate lectures has become a multifunctional place of edutainment. It has become a place where families and children spend their free time, school and university students study; doctors recall the time of their studies and revise what they have learned. The exhibition has become a place where the exhibits influence people's emotions, giving them confidence or inspiring them to make changes in their lives. The medical exhibition has also become a place for self-reflection. Attempts are made to get schoolchildren interested in biology and medicine, which has caused great competition among those who would like to take up studies of medicine at the university.

Professor of Anatomy August Antonius Rauber would definitely be most satisfied seeing that his ideas are alive.



August Antonius Rauber at the exhibition

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