



angiocode

AngioCode-301

Health Tracker

User's Manual



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Chapter

I

1 Introduction

This section contains introductory information about the AngioCode-301 device, hereinafter referred to as “device” or AngioCode.

1.1 Purpose of the device



AngioCode-301

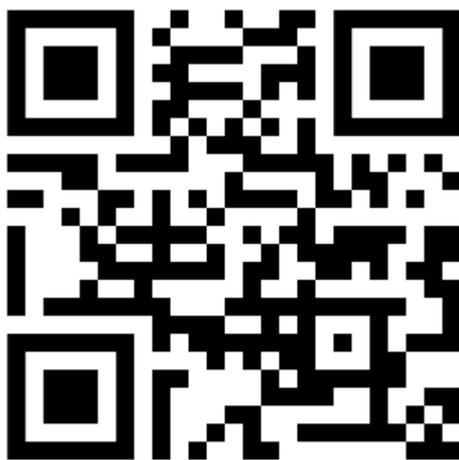
The **AngioCode-301** is a mobile health tracker that allows assessing the state of the cardiovascular system at home. The purpose of its creation is to help detect in advance the symptoms of cardiovascular diseases - such as hypertension, atherosclerosis, coronary heart disease, pre-infarction and pre-stroke conditions. These symptoms usually appear long before you feel them and decide to see a doctor. The results are stored on a personal computer or mobile device and can be transferred further for accumulation and analysis to the cloud storage.

Measured indicators

- **Oxygen saturation.** Spectral analysis of the blood flow allows you to determine how much hemoglobin in the body is in the oxygen-bound state. Especially important indicator for people with chronic lung diseases.
- **Pulse rate.** The most important parameter that allows assessing the overall fitness of the cardiovascular system.
- **Vascular age.** Indicates the condition of small arteries, the main function of which is to provide optimal blood supply to the tissues of the organs;
- **Vascular stiffness.** Assessment of arterial condition, its ability to smooth blood pulsations created by the left ventricle of the heart. Evaluation of the parameter makes it possible to assess the risk of capillary damage and impaired blood microcirculation in various organs.
- **Pulse wave type.** Assesses your arteries. The moments of formation of maxima of direct and reflected blood pressure waves and what phase of the cardiac cycle they correspond to are determined.
- **Systole duration.** The ratio of the systole duration to the total duration of the cardiac cycle reflects the features of the working cycle of the myocardium.
- **Stress level.** Reflects the state of the centers that regulate the mode of operation of the body as a whole and the cardiovascular system in particular.

The AngioCode device can be used to run tests and view test results in the following ways:

- [Offline](#). The device is controlled by buttons on its housing. Information is displayed on the built-in display of the device.
- The device can be connected to a [personal computer](#) with Windows operating system. The application for working with the device can be downloaded from the link https://angiocode.com/en_w301. The device is connected to a computer with a USB cable.
- The device can be controlled using a [mobile phone or tablet](#) with Android operating system version 6.0 and above. The device can communicate with a phone via Bluetooth interface version 4.0 or higher (Bluetooth Low Energy, BLE), as well as via USB interface using an OTG cable. The mobile application is available at the following link:



https://angiocode.com/en_a301

Documentation for the device and software is available at the following links:

User manual: https://angiocode.com/en_pdf301

Working with the device: https://angiocode.com/en_qs301

Working with a computer: https://angiocode.com/en_wpdf301

Working with a smartphone or a tablet: https://angiocode.com/en_apdf301

Updating the firmware of the device, i.e. the program, which is located in the device itself and which actually conducts tests, is possible only when the device is connected to a computer, or when the device is connected to a phone/tablet via USB. After updating the application version, the device may once give information that it is desirable to update the firmware version.

Warning! AngioCode-301 is not a medical device! This is a device for monitoring physiological parameters at home. Any data obtained using the device is for informational purposes only and cannot be used for diagnosis, treatment or therapy. For all questions about the operation of the device, you can contact [Customer service https://angiocode.com/support](https://angiocode.com/support)

1.2 Safety and terms of use

Read the instructions before using the device.

1.2.1 Safety warning

- **Keep the device out of the reach of children and pets.** To avoid accidents, keep the device and accessories out of the reach of children and pets.
- **Do not use the device in a potentially explosive or flammable environment.** Keep the device switched off at petrol stations and near containers with flammable liquids. Do not store or transport flammable liquids, gases or explosives together with the device, its components and accessories.
- **Have the device repaired only by qualified personnel.** Do not disassemble it yourself.

1.2.2 Precautions

- Before using the device, read the user manual.
- Do not expose the device to extreme temperatures (below 0 °C or above 45 °C). If the temperature is too high or too low, it will reduce the capacity and shorten the battery life.
- Do not use defective chargers.
- Do not squeeze the device hard in your hand, press the button lightly.
- Avoid getting the device wet. Moisture can cause serious damage to the device. Moisture entering the device will void the manufacturer's warranty.
- Do not use or store the device in contaminated areas. This can cause damage to moving parts of the device and reduce diagnostic quality.
- External shocks and rough handling can cause serious damage to the electronics.
- The action of the electromagnetic field can damage the device. Avoid exposing the device to strong electromagnetic fields.
- Light sources, electronic and household appliances, and wireless phones can interfere with the operation of the device.
- If you bring the package with the device from the cold into a warm room, leave it warm for two hours without opening it. Otherwise, moisture condensation can cause the device to malfunction.
- Handle the device with care, the display is made of glass and can be broken if handled carelessly.
- Do not disconnect the device from the computer, when updating the firmware. Attempting to disrupt the loading process may cause the device to malfunction that can only be repaired by a service center.

1.3 Technical specifications

Main technical specifications

- Oxygen saturation measurement range SpO₂: 35 - 100%;
- Pulse rate measurement range: 30 - 250 bpm;
- Error in measurement of oxygen saturation SpO₂: ±2%;
- Pulse rate measurement error: ±1 bpm or 1% (larger value);
- Range of measurement of pulse wave contour analysis parameters (biological vascular age, arterial wall stiffness, pulse wave type): 40 - 140 bpm;
- Stress index measurement range: 40 - 140 bpm;
- Permissible operating temperature range: +20 ... +40 °C;
- Permissible relative humidity range: 20% ... 80%;
- Computer connector: USB Type B;
- Wireless interface: Bluetooth 4.0;
- Display: IPS 1.54", 240 x 240 pixels;
- Conversion accuracy of the optical sensor, discharges: 24;
- Quantization frequency of the optical sensor: 1000 Hz;
- Power source: built-in battery, LiPol, 3.7 V;
- Duration of continuous operation of the device: 3 hours (50 testing sessions);
- Current consumption when charging the built-in battery: not more than 500 mA;

- Current consumption when operating with a computer: not more than 500 mA;
- Battery charging time: 1 hour.
- Weight, not more: 60 grams;
- Tracker dimensions: 117 x 50 x 20 mm;
- Package dimensions: 125 x 115 x 35 mm;

Technical requirements for the computer

The device operates with personal computers with minimum system requirements:

- operating system Windows XP/7/8/10;
- random access memory (RAM), not less 2 GB;
- video card with a resolution, not worse 1024x768;
- free hard drive space, not less 1 Gb;
- USB port;
- printer (optional);

Technical requirements for the mobile device

The device works with tablets or smartphones with minimum system requirements:

- operating system Android version 6.0 or later;

1.4 Windows OS requirements

The AngioCode device software operates under the following versions of the Windows operating system:

Operating system	32-bit	64-bit
Windows XP	✓	
Windows 7	✓	✓
Windows 8	✓	✓
Windows 10	✓	✓

1.5 About us

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Chapter



2 Offline use of the device

The AngioCode-301 device is designed for long-term offline use and operation under the control of a mobile device or a personal computer.

The device makes it possible to perform tests and store the results in non-volatile memory. The results are available for viewing on the screen of the device itself.

Built-in memory provides data storage for at least one hundred tests.

The device can be connected to a personal computer via USB cable and to a mobile device via Bluetooth.

You can install the application on your mobile device [AngioCode](#). On a personal computer, before you connect the device for the first time, you should install the [AngioCode](#) software, it is available on the website https://angiocode.com/en_w301. With the help of the AngioCode program and AngioCode application you can copy test data, view test results and graphs of test results over time, delete unnecessary test records from the device's memory, and perform other useful functions. For the description of the mobile application interface, see "Working with a mobile device" program description - in the chapter "[Work with a computer](#)"

[Turning on and off](#)

[Using the menu](#)

[Configuring the device](#)

[Entering individual parameters](#)

[Conducting a test - contour analysis.](#)

[Results, their values and analysis](#)

2.1 Preparation for work

First:

- remove the device from the package
- check its integrity
- read the manual
- check the completeness according to the product certificate
- check the presence and correctness of filling in the warranty card
- fully [charge the battery](#).

** If you brought the package with the device from frost to a warm room, leave it warm for two hours without opening it. Otherwise, moisture condensation can cause the device to malfunction.*

Getting started:

- [Charge your battery](#)
- [turn on the device](#)
- [set date and time](#)
- [select your personal record](#)
- [enter your individual parameters](#) (birthday, height)
- [find a quiet place, relax, take a test](#)

** Your condition, time and place of the test significantly affect the state of the body in general and the vascular system in particular. To obtain comparable results, take seriously the proposed [rules](#) for preparing and conducting the test.*

Additionally, if desired,

- [select the menu language](#)
- [customize the screen](#) (contrast, orientation)
- [adjust the sound](#)
- [update the device software \(firmware\)](#), if needed

2.2 Appearance and AngioCode-301 device



AngioCode-301 common view,

There is a display on the front panel of the device. The main units and controls are marked with numbers:

1. miniUSB connector for charging the built-in battery and transferring data to a computer;
2. main control button for turning on the device and controlling it;
3. side button to return to the main menu and turn off the device;
4. charging indicator;
5. sensor with normalized hold-down for finger fixation during the test;
6. stand, needs to be installed to ensure the correct position of the finger;

The device is equipped with a Bluetooth module for communication with mobile devices running Android 6.0 and later.

The built-in rechargeable battery allows dozens of tests to be performed in offline mode. The AngioCode-301 non-volatile memory can store at least a thousand test results.

2.3 Turning on and off

The AngioCode-301 is turned on by pressing and holding the button once for three seconds.

You can turn off the device through the menu, by long pressing the side button, or wait for it to turn off automatically. If the test is not performed and there are no button pressed, then after 60 seconds the device will turn off automatically.

- To turn on, hold the top device [control button](#) until the device is turned on (at least 3 seconds).
- The splash screen will be displayed.
- At this point it will play [sound greeting](#), if allowed by the settings.
- Pay attention to the battery charging icon - if it looks like  or , the battery is discharged and should be recharged before the device can be used. Connect the device to the charger or your computer.
- The device can be turned off via the menu or by long pressing on the side button.
- If you do not perform the test and do not press any buttons, the device will turn off automatically after 2 minutes.



- After the splash screen, the home page of the menu will be presented.
- By short pressing the top button, you can move the cursor to the desired menu item.
- By long pressing you can confirm your choice and go to the submenu page.



- To turn off the device, move the cursor to the <Power off> position with short press
- A long press on the top button in this menu state will turn off the device.
- You can also turn off the device by long pressing the side button.



2.4 Control

The device is equipped with an intuitive [menu system](#) and is controlled by two buttons: top (main) and side (secondary). [Sound indication](#) also helps in the operation of the device.

- The device is controlled by two buttons: the main one, located under the screen, and the side button, located to the right of the screen.
- There are two types of pressing the button:
 - short - less than one second;
 - long - more than one second.
- *Short press* on the **main button** moves the cursor to the *next menu item* or the *next* input parameter. Short press during the test - ends the test.
- *Long press* on the **main button** moves to the *next menu page*, returns to the *previous menu* level, *changes value of the* selected option.
- *Short press* on the **side button** quickly moves to the main menu.

- *Long press* on the **side button** turns off the device.

Pressing the button is accompanied by a short beep at the very beginning. If you continue to hold the button, it will trigger page navigation with a long beep. If you release the button immediately after pressing it, the cursor will move through the menu items. In this case, releasing the button is accompanied by a long beep.

*[The sound that accompanies button presses can be turned off](#) at the request of the user.

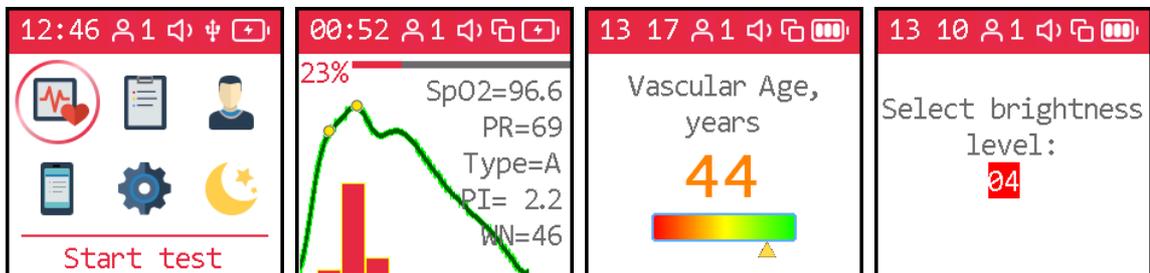
2.5 Display

The device is equipped with a high-contrast color display.



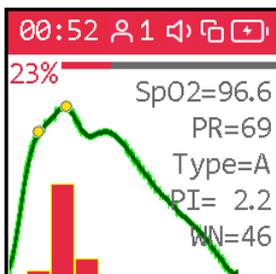
Starting splash screen.

- size - 1.54"
- number of colors - 262,000.
- number of points - 240*240
- technology - TFT



The display is used, when controlling the device, to display the progress of the test and its results.

During the test, the display shows the current pulse wave and some of its indexes:



- **SpO2** - blood oxygen saturation
- **PR** - [pulse rate](#)
- **Type** - [pulse wave type](#)
- **PI** - [perfusion index](#)
- **WN** - number of pulse waves selected for subsequent analysis

* *Handle with care, the display is made of glass and can be broken if handled carelessly.*

There is a status bar at the top of the display:



The status bar displays:

- [current time](#) when conducting a test - the time until the end of the test
- [user number](#)
- condition [audio indication](#)
- status of the control and communication interface
- battery [power level](#)

Types and meanings of pictograms used are described in more detail in [“Signs”](#).

2.6 Icons

The device status bar uses various icons.



12:50	Current time
00:02	Finger position check countdown
00:52	Passing test countdown
1	User number
Speaker icon	Sound indication enabled
Speaker icon with X	Sound indication completely disabled
Bluetooth icon	Bluetooth channel is active, the device is controlled by a smartphone
USB icon	USB interface is active, the device is controlled by a computer or smartphone
Local control icon	The device is offline, controlled by local buttons
Battery icon with X	The battery is empty, connect the device to the charger
Battery icon with 10% charge	Battery charge 10%
Battery icon with 50% charge	Battery charge 50%
Battery icon with 100% charge	Battery is fully charged



Battery is charging

The icons on the bottom menu bar are used to display buttons when navigating through records of previous test results.



-  Go to previous record
-  Go to next record
-  Open selected record
-  Delete selected record
-  Exit the record management menu

The cursor is moved by a short press on the main control button.

2.7 Sound indication

The AngioCode-301 has a built-in sound emitter to confirm the pressing of the button and sound indication of the device's operating modes.

Sound indication is provided for:

- turning on the device
- pressing a button
- releasing a button
- navigation between menu items
- menu page change
- changing parameter values
- change of choices
- conducting test
- end of test

You [can turn all sounds on or off](#) at once or in separate groups:

- all sounds
- pressing a button
- test process
- end of test
- greetings



2.8 Battery charging

To charge the battery:

- insert the narrow end of the USB cable into the connector located on the end of the device;
- plug the wide end of the USB cable into the USB port on your computer or use any standard USB charger;
- leave the device connected to the charging source until charging is complete. The activity indicator of the charging process is the glow of the blue indicator near the USB connector of the device. When the charging procedure is completed, the blue indicator will turn off.
- disconnect the device from the charging source.

For subsequent use, pay attention to the charging indicator icon.

If the number of bars on the charge indicator is less than two, or when their color changes to red, connect the device to a charging source.

2.9 Device firmware update

The device is constantly improved and its software is regularly updated by the developer.

The device has a built-in software (firmware) update function.

Firmware update:

- download the latest **AngioCode software**: https://angiocode.com/en_w301;
- install the downloaded version on your computer and run the AngioCode program;
- connect the device to the USB port of your computer using the USB cable (included in the package);
- [turn on](#) the device;
- firmware update will start automatically. A message about the firmware update will appear on the device screen. Wait for the update process to complete.

Warning! *Do not turn off the device and do not unplug the USB cable until the process is complete!*

Violation of the firmware update process can lead to the device failure. To restore functionality, contact the service center.

2.10 Using the menu

- A short press on the main control button cycles the cursor to the next menu item:
Start test --> Results --> User --> Display options --> Device options --> Disable --> Start test
- A long press on the control button confirms the selection and switches the menu page or mode.
- A short press on the side button causes the transition to the main menu.

2.11 Configuring the device

General device settings include menu language selection, current date and time setting, sound indication type and presence selection, screen contrast and orientation selection.

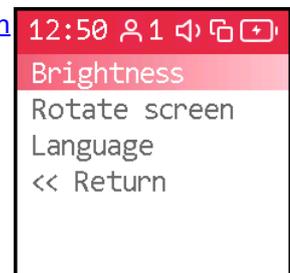


- Short press the main control button to move the cursor to the desired position on the first page of the menu
- Long press to go to the desired submenu



Press and hold the button until you get to the [screen settings](#) submenu.

- [Adjusting the screen brightness](#)
- [Menu color selection](#)
- [Screen rotation ± 90°, 180°](#)
- [Menu language selection](#)



Press and hold the button until you get to the general settings submenu.

- [Setting the date and current time](#)
- [Setting sound indication](#)
- [View firmware version](#)



2.11.1 Setting the date and time

Set the date and time before operating the device.

To set the current date, use the submenu *[Device options]*, *[Date]*.



- Short presses on the main control button move the cursor to the *[Device options]* position of the menu
- Press and hold the button until you get to the *[Device options]* submenu. Release the button.



- Press and hold the button until the date setting submenu is displayed. Release the button.
- Press and hold the button until tens of years are set. Release the button.
- Short press to move the cursor to the field with the year.

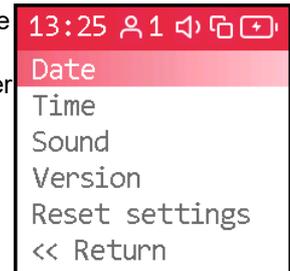




- Press and hold the button until the desired year is set. Release the button.
- Move the cursor to the field with the month by shortly pressing it.
- Press and hold the button until the desired month is set. Release the button.



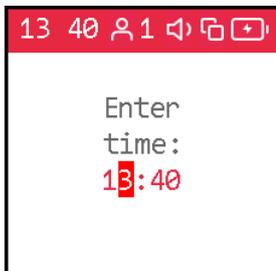
- Short press to move the cursor to the field with the number.
- Press and hold the button until the desired number is set. Release the button.
- To exit to the previous level, use a short press on the main button.
- You can use a short press on the side button to go directly to the main menu.



To set the current time, use the submenu *[Device options]*, *[Time]*.



- With short presses move the cursor to the *[Time position]*
- Press and hold the button until the time setting submenu is displayed. Release the button.
- Press and hold the button until the tens of hours are set. Release the button.



- Short press to move the cursor to the hours field.
- Press and hold the button until the hours are set. Release the button.
- Short press to move the cursor to the tens of minutes field. Long press to set the desired value.
- Next, set the minutes.
- To exit to the previous level, use a short press on the main button.



After setting the date and time, you can proceed to the [audio indication](#) settings.

You can also return to the first page of the menu via *[Return]* item or by briefly pressing the side button.



- Short presses on the main button move the cursor to the *[Return]* position.
- Press and hold the button until the first page of the menu is displayed



2.11.2 Sound control

The AngioCode-301 has a built-in sound emitter to confirm the pressing of the button and sound indication

of the device's operating modes.

Sound indication is provided for:

- turning on the device
- pressing a button
- releasing a button
- navigation between menu items
- menu page change
- changing parameter values
- change of choices
- conducting test
- end of test

You can turn all sounds on or off at once or in separate groups:

- pressing a button
- test process
- end of test
- greetings

When the *[All sounds]* submenu is set to *Sound: Off*, all sounds will be muted.

When the *[All sounds]* submenu is set to *Sound: On*, all sounds will be turned on.

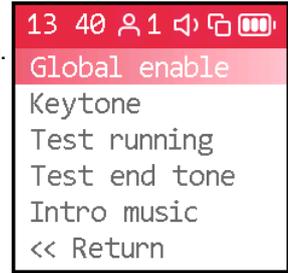
You can enter any of the sound control submenus: *[Button press]*, *[Test process]*, *[Test end]*, *[Greetings]* and select separately for each of these groups the sound state: *On* or *Off*.

To set the sound indication parameters, use the submenu *[Device options]*, *[Sound]*.

 <p>12:46 1 1 1 1 1</p> <p>Start test</p>	<ul style="list-style-type: none"> • Briefly press the main button to move the cursor to the <i>[Device options]</i> position on the first page of the menu 	 <p>12:46 1 1 1 1 1</p> <p>Device options</p>
 <p>13:25 1 1 1 1 1</p> <p>Date</p> <p>Time</p> <p>Sound</p> <p>Version</p> <p>Reset settings</p> <p><< Return</p>	<ul style="list-style-type: none"> • Press and hold the button until you get to the general settings submenu. • With short presses move the cursor to the <i>[Sound]</i> position 	 <p>13 26 1 1 1 1 1</p> <p>Date</p> <p>Time</p> <p>Sound</p> <p>Version</p> <p>Reset settings</p> <p><< Return</p>
 <p>13 40 1 1 1 1 1</p> <p>Global enable</p> <p>Keytone</p> <p>Test running</p> <p>Test end tone</p> <p>Intro music</p> <p><< Return</p>	<ul style="list-style-type: none"> • Press and hold the button until you get to the sound indication settings submenu. Release the button. • Press and hold the button until you get to the <i>[All sounds]</i> submenu 	 <p>13 41 1 1 1 1 1</p> <p>Sound:</p> <p>On</p>



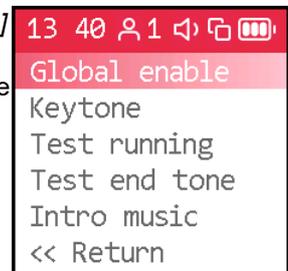
- Press and hold the button until the desired sound state is selected: *[On]* or *[Off]* Release the button.
- To exit to the previous level, briefly press the control button



- Briefly press the control button to move the cursor to the desired position: *[Button press]*, *[Test process]*, *[Test end]* or *[Greetings]*
- Press and hold the button until you get to the selected submenu.



- Long press to select the desired sound state: *[On]* or *[Off]*
- To exit to the previous menu level, briefly press the control button.



After selecting all desired sound indication settings, you can return to the first page of the menu.



- Make five short presses on the control button to move the cursor to the *[Return]* position
- Press and hold the button until you get to the submenu of the general program settings.



- Briefly press the main button to move the cursor to the *[Return]* position.
- Press and hold the button until the first page of the menu is displayed

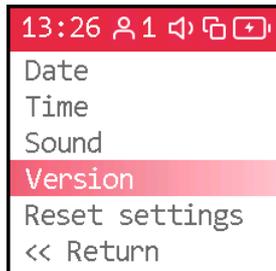


2.11.3 Firmware version

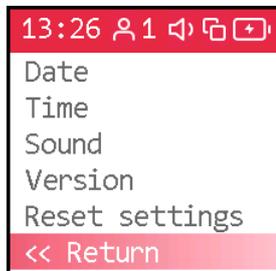
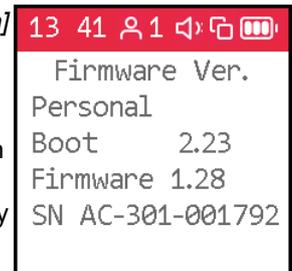
To view the firmware version, use the submenu *[Device options]*, *[Version]*.



- Short presses on the main control button move the cursor to the [Device options] position of the menu
- Press and hold the button until you get to the [Device options] submenu. Release the button.



- By short pressing move the cursor to the [Version] field.
- Press and hold the button until the firmware information page is displayed.
- To exit to the previous level, briefly press the main button.
- You can briefly press the side button to go directly to the main menu.



- Briefly press the main button to move the cursor to the [Return] position.
- Press and hold the button until the first page of the menu is displayed

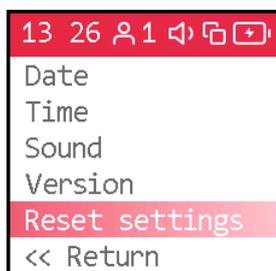


2.11.4 Reset to factory settings

To reset the device to the factory settings and completely delete all data from the built-in non-volatile memory, use the submenu [Device options], [Reset settings].



- Short presses on the main control button move the cursor to the [Device options] position of the menu
- Press and hold the button until you get to the [Device options] submenu. Release the button.

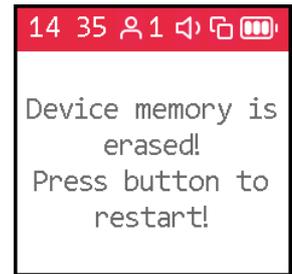


- By short pressing move the cursor to the [Reset settings] field.
- Press and hold the button until the reset menu is displayed.
- Press the button briefly to allow the device to be reset and its memory erased.
- To return to the previous menu level without resetting the device, make sure that resetting is disabled. Press and hold the button until you get to the [Device options] submenu.





- To reset the device, make sure that resetting is enabled.
- Press and hold the button until the device is reset and its memory is completely erased.
- Press the button again to reset the device. Reset complete



2.11.5 Screen setup

You can customize the screen to suit your needs.

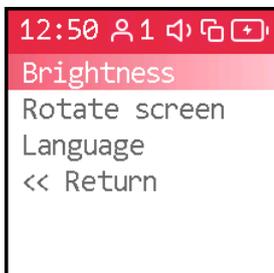
There is a choice of one of six levels of screen brightness (from 0 to 5). Level 3 is set by default. Lower levels drain the battery more slowly. Higher levels will be more convenient in case of increased lighting at the place of use of the device.

When delivered, the screen is oriented straight. If desired, for testing on the right hand, you can change the orientation to *[Clockwise]*. To work with the left hand - *[Counter-clockwise]*.

To set screen parameters use the submenu *[Screen options]*, *[Brightness]*, *[Menu color]*, *[Screen rotation]*, *[Language]*.



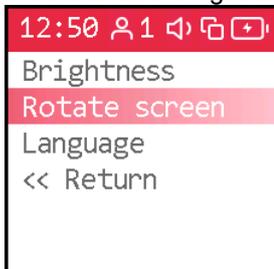
- Briefly press the main button to move the cursor to the *[Screen options]* position on the first page of the menu
- Press and hold the button until you get to the screen setup submenu.



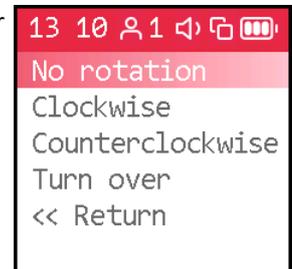
- Press and hold the button until you get to the *[Brightness]* submenu.
- Long press the main button to select the desired brightness level.
- To exit to the previous level, briefly press the main button.
- You can briefly press the side button to go directly to the main menu.

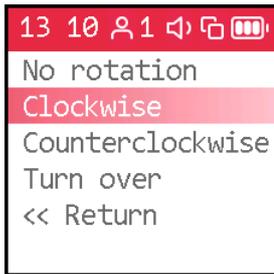


If desired, you can expand the image on the screen so that it is convenient to carry out the tests on the right and left hand, or show the results to another person.

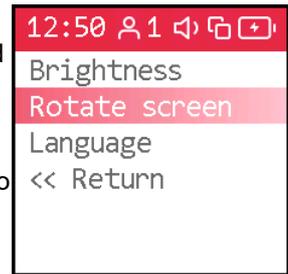


- Briefly press the control button to move the cursor to the *[Screen rotation]* position
- Press and hold the button until you get to the screen orientation selection submenu.

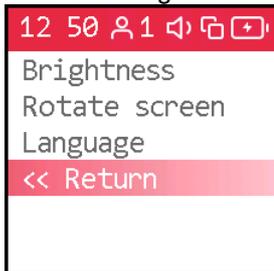




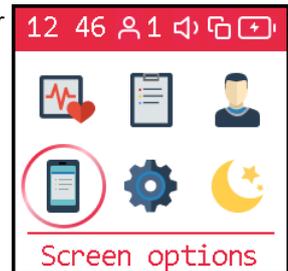
- With short presses on the main button, move the cursor to the position with the name of the desired screen location.
- Press and hold the button until the screen orientation changes.
- Briefly press the main button to move the cursor to the *[Return]* position.
- Press and hold the button until you return to the *[Display options]* submenu.
- You can briefly press the side button to go directly to the main menu.



After selecting the desired screen settings, you can return to the first page of the menu.



- Short presses on the main button move the cursor to the *[Return]* position
- Press and hold the button until you get to the first page of the menu.



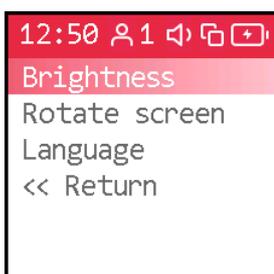
2.11.6 Menu language selection

The device supports several menu and message languages.

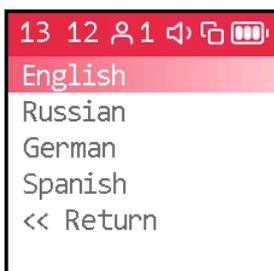
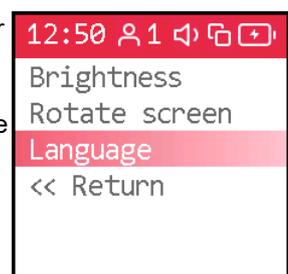
To select the desired language use the submenu *[Device options]*, *[Language]*.



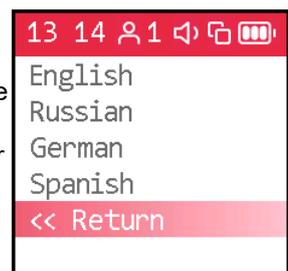
- Short presses on the main button move the cursor to the *[Screen options]* position of the menu
- Press and hold the button until the screen settings submenu is displayed.



- Short presses on the main button move the cursor to the *[Language]*
- Press and hold the button until the menu language submenu is displayed.

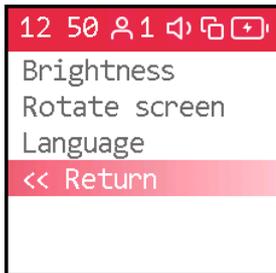


- Short presses on the main button to select the desired menu language
- Press and hold the button until the menu language is switched.
- Short presses on the main button move the cursor to the *[Return]* position
- Press and hold the button until you get to the first page of the menu.





- To exit to the previous level, briefly press the main button.
- You can briefly press the side button to go directly to the main menu.



- Short presses on the main button move the cursor to the *[Return]* position.
- Press and hold the button until the first page of the menu is displayed



2.12 Entering individual parameters

Indexes of cardiovascular system are interconnected with the properties of your body and its condition. As you age, your blood vessels become stiffer. What is normal for a middle-aged person may be a sign of illness for a young person. To correctly interpret test results, they should be correlated with the [age](#), [height](#) of the subject.

The device can store test results for up to nine users in its memory. For each, you need to set individual values of age, height. Before entering these data, you should select the desired [user number](#).

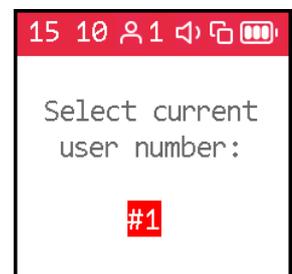
To enter individual parameters, use the *[User]* submenu.



- Briefly press the main button to move the cursor to the *[User]* menu item.
- Press and hold the button until the *[User]*. Release the button.



- Briefly press the button to move the cursor to the position *[Database number]*, *[Birthday]*, *[Height]*
- Press and hold the button until you get to the desired submenu

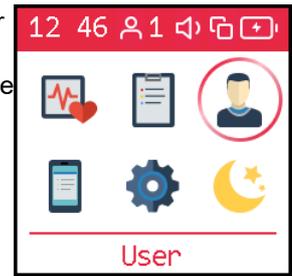


2.12.1 User number

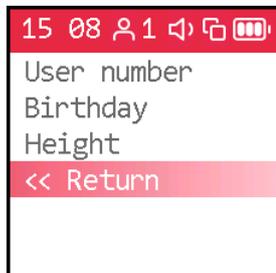
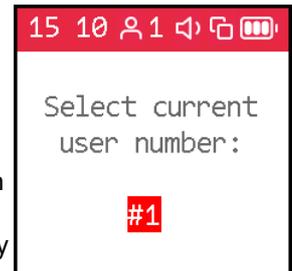
To select a user number, enter the submenu *[User]*, *[Database number]*.



- Briefly press the control button to move the cursor to the *[User]* menu item.
- Press and hold the button until the *[User]*. Release the button.



- Press and hold the button until you get to the individual settings submenu *[Database number]*. Release the button.
- Press and hold the button until the desired user number is selected. Release the button.
- To exit to the previous level, briefly press the main button.
- You can briefly press the side button to go directly to the main menu.



- Briefly press the control button to move the cursor to the *[Return]* position.
- Press and hold the button until you get to the first page of the menu.



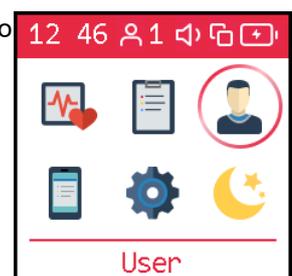
If the user number is selected for the first time, you will be immediately prompted to enter [birthday](#), [height](#). After changing the user number, you can proceed to set other individual parameters, or return to the first page of the menu.

2.12.2 Birthday

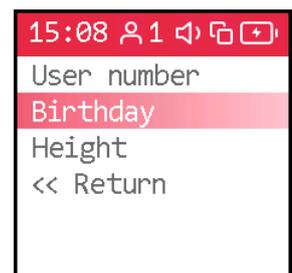
To enter the user's birthday, enter the submenu *[User]*, *[Birthday]*.

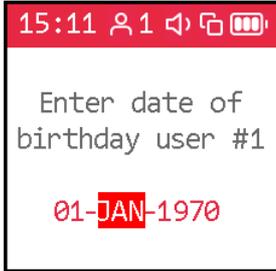
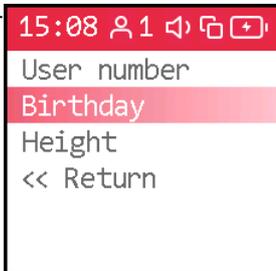


- Briefly press the main button to move the cursor to the *[User]* menu item.
- Press and hold the button until the *[User]* submenu. Release the button.



- Briefly press the button to move the cursor to the *[Birthday]* menu item.
- Press and hold the button until you get to the *[Birthday]* submenu.



	<ul style="list-style-type: none"> • Press and hold the button until the desired century is set. Release the button. • Briefly press to move the cursor to the field with the decade number. • Press and hold the button until the desired decade is set. Release the button. • Briefly press to move the cursor to the field with the year. 	
	<ul style="list-style-type: none"> • Press and hold the button until the desired year is set. Release the button. • Move the cursor to the field with the month by shortly pressing it. • Press and hold the button until the desired month is set. Release the button. • Briefly press to move the cursor to the field with the number. 	
	<ul style="list-style-type: none"> • Press and hold the button until the desired number is set. Release the button. • To exit to the previous level, briefly press the control button • You can briefly press the side button to go directly to the main menu. 	

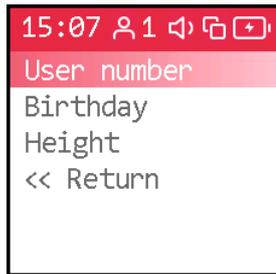
If the user number is selected for the first time, you will be immediately prompted to enter [birthday](#), [height](#). After changing the user number, you can proceed to set other individual parameters, or return to the first page of the menu.

	<ul style="list-style-type: none"> • Briefly press the control button to move the cursor to the <i>[Return]</i> position • Press and hold the button until you get to the first page of the menu. 	
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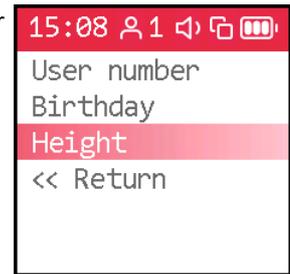
2.12.3 Height

To set the user height, enter the submenu *[User]*, *[Height]*.

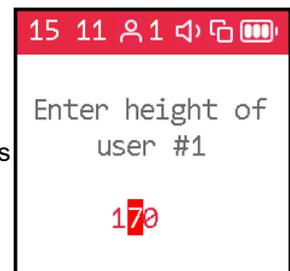
	<ul style="list-style-type: none"> • Short presses on the main button move the cursor to the <i>[User]</i> position on the first page of the menu • Press and hold the button until the <i>[User]</i>. Release the button. 	
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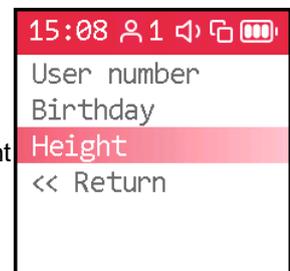
- Briefly press the control button to move the cursor to the *[Height]* submenu is displayed.
- Press and hold the button until the *[Height]* submenu is displayed.



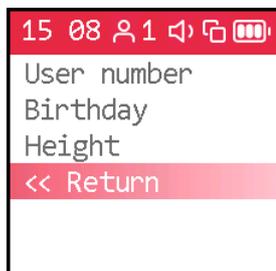
- Press and hold the button until hundreds of centimeters of height are set. Release the button.
- Briefly press on the control button to move the cursor to the position of tens of centimeters.
- Press and hold the button until tens of centimeters of height are set. Release the button.



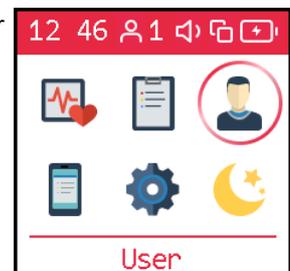
- Press and hold the button until the centimeters of height are set. Release the button.
- To exit to the previous level, briefly press the control button
- You can briefly press the side button to go straight to the main menu.



After entering the user height, you can move on to setting other individual parameters, or return to the first page of the menu.



- Briefly press the control button to move the cursor to the *[Returns]* position
- Press and hold the button until you get to the first page of the menu.



2.13 Assessment of the body state - conducting a test

The human cardiovascular system connects all parts of the body. Everything that happens to the body and mind of a person affects how the heart works, how blood flows through the vessels. And vice versa, any changes in the cardiovascular system, the state of the heart and blood vessels respond in all parts of the body. Watching the pulse, you can notice many undesirable changes, prevent diseases, learn about the effects of diets, medicines. About their beneficence or futility.

The **AngioCode-301** device makes it possible to see how blood fills the capillaries of the finger with each heartbeat. Recording and subsequent analysis of each of the heartbeats can tell a lot about the state of large and small arteries, about the degree of tension in which the mind and heart of a person is. Some of the pulse analysis methods used here have long been known to experienced physicians, others are possible thanks to the discoveries of recent years.

This test evaluates the following indexes of the cardiovascular system: pulse rate, vascular stiffness, the level of excess pressure of late systole over the average, the biological vascular ageing, the normalized duration of mechanical systole. The stress level of the body is assessed.

You can conduct a one-time test with the **AngioCode-301** device to assess the state of the body “here and now”. But it is more interesting and more productive to conduct the test regularly. If you follow simple rules, you will get comparable results. It will be possible to trace the changes taking place in the body, see the benefits of the prescribed treatment or lifestyle changes. You can also notice unwanted changes and promptly seek help from specialists.

To obtain reliable data, when working with the **AngioCode-301** device, follow simple but necessary rules. Start by reading the sections of the manual:

- [Preparation for the test](#)
- [Choosing the time and place of the test](#)
- [Behavior during the test](#)
- [Placing the device on the finger](#)
- [Hand position](#)
- [Selecting a personal record](#)
- [Test start, run and end](#)
- [Viewing results after a test](#)
- [Viewing previously saved results](#)

For a better understanding of the results, refer to their [description](#).

2.13.1 Preparation for the test

The parameters of the cardiovascular system sensitively respond to the state of the body and its nervous system. Try to exclude factors that distort the results before conducting the test.

With a healthy lifestyle, exclude at least a day before the test:

- tobacco smoking
- taking vasoactive drugs
- caffeine intake
- alcohol intake
- taking stimulants (“energy drinks”)
- heavy physical activity

If you are prescribed drugs for permanent use, you smoke, or have other permanent addictions, the test will also be indicative. In this case, remember that not you are being tested, but, say, “You and tobacco”. One cigarette right before a vascular checkup can ruin your performance for ten years of unhealthy life.

Rest for at least ten minutes in a warm, darkened, quiet room immediately before the test.

Cold hands can result in a low perfusion index. Warm your hands if necessary.

Dark nail polish may interfere with the operation of the device. If it is not possible to remove the varnish, turn the device 90 degrees so that the sensor light passes along the nail.

2.13.2 Choosing the time and place of the test

You can perform the test anywhere, anytime. It is enough to remember that time and place affect the results. It is good if you have the opportunity to choose a quiet, warm room without bright lighting. You can take the test in a lying or sitting position, on the right or left hand. Care should be taken to ensure that the hand during the test was located approximately at the level of the heart. This is especially important for the test in a sitting position. The metatarsal and elbow joints should be located stable and motionless, for example, on a table.

Avoid direct sunlight, illumination from a working TV, computer monitor, and other rapidly changing light sources on the device.

You can only compare data obtained in the same way:

- at the same time of day
- in the same body position
- on the same hand

For example, you regularly run three tests a day:

- in the morning before getting up, on the right hand, lying
- before dinner, on the right hand, sitting
- in the evening before going to bed, on the right hand, lying

It will make sense to compare morning with morning, dinner with dinner, evening with evening.

2.13.3 Behavior during the test

The device is equipped with highly sensitive sensors. This is necessary for the correct assessment of the indexes of the vascular system and the body as a whole. To reduce errors during the test, follow the following rules:

- stay calm
- relax your arms, legs, stomach
- breathe easy
- do not move your hand and finger with the device
- don't talk
- don't laugh
- avoid vibration
- exclude bright light

2.13.4 Placing the device on the finger

- Move the support, from the bottom of the device housing, to the working, open position.
- Turn your right hand palm down.
- Take the device in your left hand from the side of the screen, screen up.
- Insert the index finger of the right hand from the side opposite the screen.
- If your nails are covered with dark varnish, try turning the device with the screen facing you.

2.13.5 Hand position

- **In a lying position** place the right hand with the device along the body on a dense pillow, or in the middle of the chest.
- **In a sitting position** place your right hand with the device on the table surface. The elbow should also be on the table.
- **Remember the selected hand** position and use it every time.

2.13.6 Selecting a personal record

The device allows keeping up to nine independent logs with test results. This makes it possible to independently track changes in indexes for nine users.

Before starting the test, you should check which user number is selected and, if necessary, [change](#) to the right one.

2.13.7 Starting and running the test and ending the test



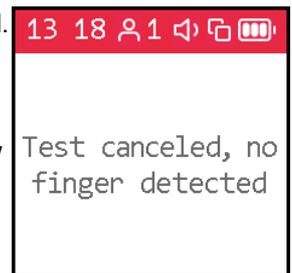
- To turn on, hold the [main button](#) of the device until it turns on.
- The splash screen will be displayed.
- With appropriate settings, at this point, it will play [sound greeting](#).
- After the splash screen, the home page of the menu will be presented.
- To start the test press and hold the control button at the *[Start test]* position of the cursor until you get to the beginning of the test



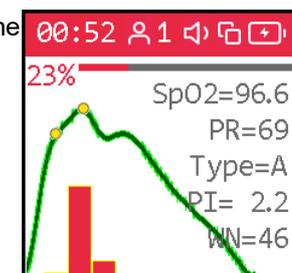
- You have ten seconds to place the device on the finger.
- If the finger is not in place within the set time, the device is in the wrong position, motor activity is detected, the test will be interrupted.
- The main menu can be accessed by short pressing the control button.



- If the finger is in place, the sensor will be adjusted. In this mode, the timer in the status bar counts down the tuning time.
- Next, an initial assessment of the pulse parameters will be carried out. The timer will show the time spent on this assessment.



- During data acquisition, the screen will display the pulse wave form, number of accumulated waves, pulse rate, pulse wave type, and pulse level.
- The end of the test is accompanied by a sound and a message on the device display.
- **PR** - [pulse rate](#)
- **Type** - [pulse wave type](#)
- **PI** - [perfusion index](#)
- **SpO2** - [Saturation of blood hemoglobin with oxygen](#)
- **WN** - number of pulse waves selected for subsequent analysis



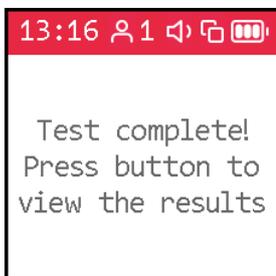
- The test ends automatically after a set number of pulse waves (200 pulses).
- Pressing the main button during the test stops it, the results are not saved.
- Removing the finger before the end of the set time ends the test without saving the results.



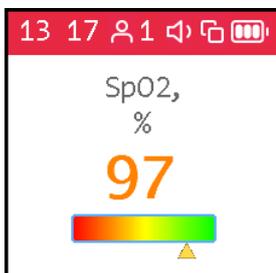
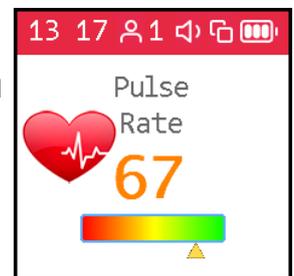
2.13.8 Viewing results after a test

Immediately after running the test, you will be prompted to view its results. Indexes of the state of the body and, in particular, the cardiovascular system will be presented on several pages. One index per page. A description of each of the indexes is given in the corresponding section "[How to evaluate your test results](#)".

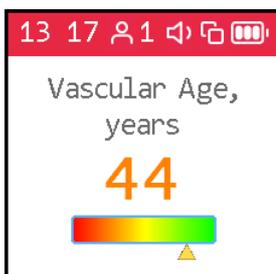
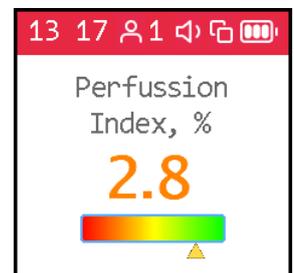
The results of the last and previous tests can be [viewed](#) using the menu [Test options], [Database].



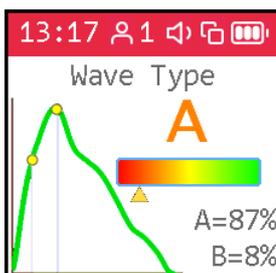
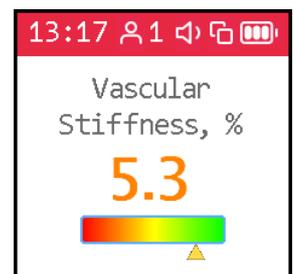
- During data collection, the screen will display the pulse wave form, the number of accumulated waves, the pulse rate, the type of pulse wave, and the saturation level, pulse rate.
- The end of the test is accompanied by a sound and a message on the device display.



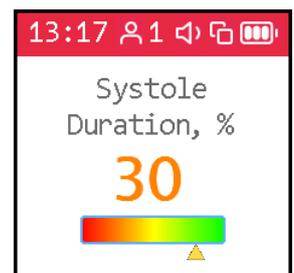
- By briefly pressing the control button, switch the device to the results display mode.
- The page with each of the indexes contains a conditional scale. The position of the mark on the scale is determined by the current grade.



- The right, green side of the scale corresponds to good, superior, or appropriate age norms.
- The mark on the left, red side of the scale indicates possible problems.



- A short press on the button displays a page with the next index.
- The last short press on the button displays the first page of the menu.





- A description of the indexes can be found in the section: [“How to evaluate your test results”](#)



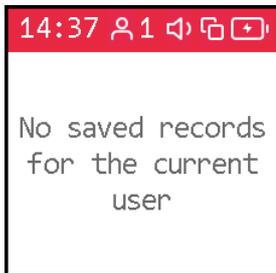
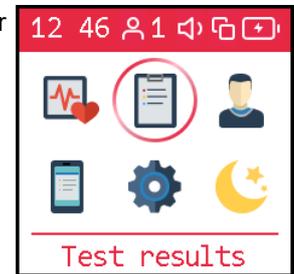
2.13.9 Viewing previously saved results

Before accessing the database of saved results [select](#) the desired user number.

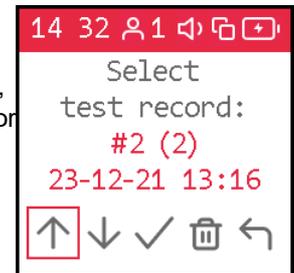
The results of the last and previous tests are available using the *[Results]* submenu. The user number is displayed in the upper status bar. It is for this user that the data from the results database will be provided. To view another user's data [change user number](#).



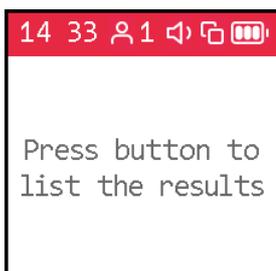
- Briefly press the control button to move the cursor to the *[Results]* menu item.



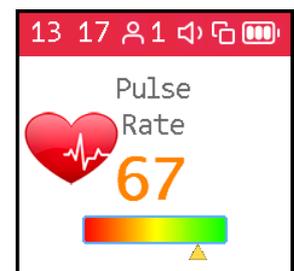
- Press and hold the button until the *[Results]*. Release the button.
- If there are no result records for the selected user, a message will be displayed: “No saved records for the current user”



- If there are records, you will be prompted to select the one you want to display. For the selected record, the number, date and time of the test are displayed.
- Short presses on the control button move the cursor to the position:
 - ↑ to go to previous records
 - ↓ to go to subsequent records
- Press and hold the button until the desired recording is selected. Release the button.

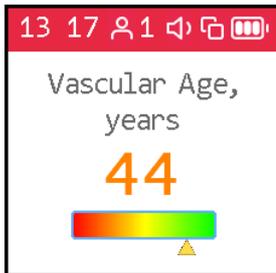
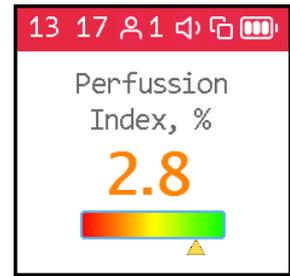


- Short presses on the control button move the cursor to the position ✓
- Press and hold the button until the results of the selected recording are displayed. Release the button.

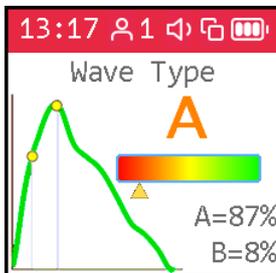
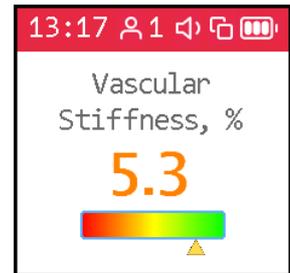




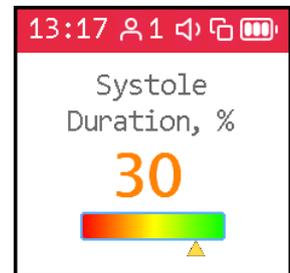
- By briefly pressing the control button, switch the device to the results display mode.
- Each subsequent short press on the button will display a new page with the next index.



- The page with each of the indexes contains a conditional scale. The position of the mark on the scale is determined by the current grade.
- The right, green side of the scale corresponds to good, superior, or appropriate age norms.
- The mark on the left, red side of the scale indicates possible problems.



- A short press on the button displays a page with the next index.
- The last short press on the button brings up a menu for viewing the database.
- A description of the indexes can be found in the section: [“Results, their value and analysis”](#)



- Then you can continue browsing through the user records.



- To delete a record from the device's non-volatile memory, short press the button to move the cursor to the position and long press to delete.
- To return to the first page of the menu, short press the button to move the cursor to the position .
- Press and hold the button until the transition. Release the button.

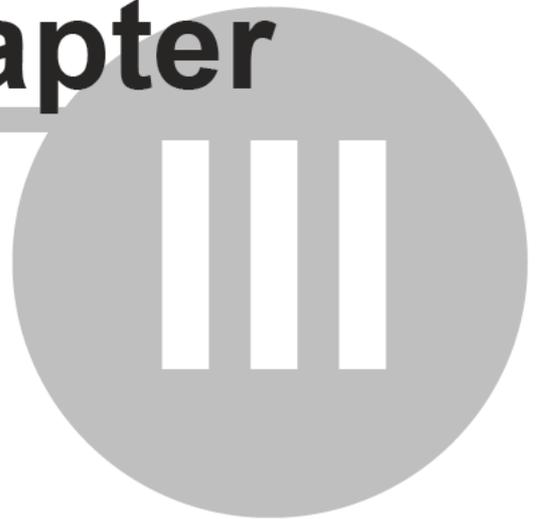


2.14 Troubleshooting

Description of the situation.	Possible reasons	Remedy
▪ When the main button is pressed, the device does not turn on: the screen does not light up, there is no greeting sound.	▪ Low battery	▪ Charge your battery
	▪ Wrong firmware	▪ Update device firmware
	▪ The device is defective	▪ Please contact your device supplier.

▪ <i>When the button is pressed, the screen does not turn on: the screen does not light up, there is a greeting sound.</i>	▪ Display failure	▪ Please contact your device supplier.
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Chapter



3 How to evaluate your test results on the device

- Pulse rate;
- Oxygen saturation;
- Perfusion index;
- Vascular age;
- Vascular stiffness;
- Pulse wave type;
- Systole duration;
- Stress level.

When displaying the results for each indicator, the device displays the score numerically and on a diagram divided into color zones. The color zones correspond to a qualitative assessment of the values of the indicators:

- **green** - good condition;
- **yellow** - satisfactory condition, but the probability of functional disorders of the body, including disorders of the cardiovascular system, is increased;
- **red** - bad condition, there is a high probability of cardiovascular disease. Reason to visit a specialist and conduct a detailed analysis of risk factors.

Remember that the human body is a complex system with many subsystems and their interconnections. Throughout the life, with the change of seasons, during the circadian cycle, with each inhalation and exhalation there are noticeable changes in the inner state. All these changes are reflected in the pulse features. The organism in its normal state is not in equilibrium, as previously thought, but in a constant journey through the phase space of states, like a river seeking its way within its floodplain. Illnesses, stresses, hardships, joys change the terrain over which the body's condition "journeys". Watching the heartbeat, sometimes you can identify serious problems or significant abnormalities and take action - visit a specialist, adjust the regime, lifestyle.

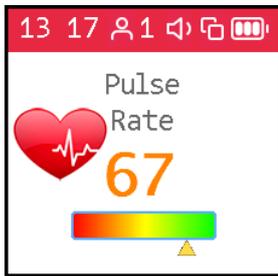
The evaluated indicators represent a view from different sides of the single. Often, an improvement in one is combined with a loss in the other.

Some typical situations:

- Increase in blood pressure, increase in pulse rate - improve the supply of blood to small vessels, and reduce the vascular ageing index.
- Taking vasoactive drugs improves vascular elasticity, reduces the strain on the heart and puts the body in an unaccustomed state, which increases stress levels. After some time - days, weeks, a new set of habitual internal states, a new route of their passage will be established, and the stress index will normalize.

If you want to measure progress over time, do the tests at the same time, in the same posture, in the same condition. To assess a specific impact on your body (e.g. diet change, fitness session, etc.) conduct two tests - a pre-exposure test, then a post-exposure test and use the difference in the results to draw a conclusion about the impact.

3.1 Pulse rate



Pulse rate or the number of heartbeats per minute. The inverse of this value is the pulse wave duration. The device evaluates the duration of each pulse wave, calculates the instantaneous value of the pulse frequency, and determines the average value based on the test results.

This is an important indicator, primarily reflecting the fitness of the body. The higher the resting heart rate, the less trained the body and the cardiovascular system in particular. For those who regularly exercise, the resting heart rate has values in the range of 55-60. It can be assessed as an excellent condition. 60-80 is good, more than 90 is bad.

A more reliable assessment of the fitness of the body can be obtained by conducting load tests.

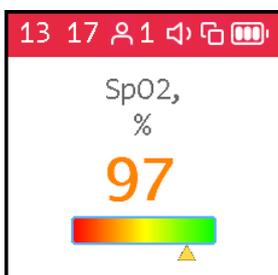
As an option:

1. Determine the pulse rate in a normal resting state.
2. Do 20 squats in 30 seconds.
3. After 3 minutes, reassess heart rate and calculate the difference between the second and first results.

Result:

- good fitness - up to 5 beats;
- satisfactory - 5-10 beats;
- low - more than 10 beats.

3.2 Oxygen saturation



Oxygen, inhaled with atmospheric air, is transferred to the organs with the help of a special carrier protein - hemoglobin, which is contained in red blood cells, erythrocytes. The oxygen level in the blood or the oxygen saturation degree of the blood shows how much hemoglobin in the body is in a state associated with oxygen.

Oxygen saturation - saturation (SpO2) of blood hemoglobin with oxygen is a vital indicator, the value of which is determined by:

- pumping function of the heart
- ability of the lungs to oxygenate the blood
- state of hemoglobin - oxygen carrier

Normally, almost all hemoglobin is associated with oxygen, while the hemoglobin saturation with oxygen varies in the range from 96% to 99%. A steady decrease in the saturation level below 95% can be observed with disorders in the respiratory and cardiovascular systems.

With chronic diseases of the heart and lungs, a decrease in this indicator may indicate an exacerbation of the disease, in such situation, one should seek medical help. A decrease in the level of saturation of hemoglobin with oxygen against the background of a cold, flu, acute respiratory viral infections, pneumonia and other lung diseases may indicate a complicated course of the disease.

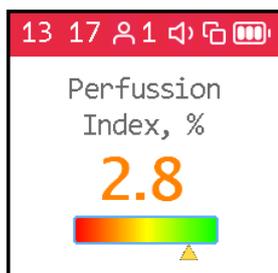
The saturation level indicator is important for people with chronic lung diseases, including chronic bronchitis.

When performing a study, it should be taken into account that a number of factors can lead to an error in assessing the level of oxygen in the blood. Such factors include the presence of a manicure, especially with the use of dark shades of varnish, the movement of hands or trembling of the fingers during the examination, the presence of a strong external light source - solar or artificial, and the close proximity of sources of strong electromagnetic radiation, such as mobile phones. The low temperature in the study room can also lead to errors in the SpO₂ assessment.

There may be slight individual fluctuations in the saturation level. To correctly interpret the score for this indicator, several tests should be performed. This will reveal the individual characteristics of fluctuations in the level of oxygen in the blood, and will help to correctly interpret certain changes in the future.

A sharp decrease in SpO₂ by 3-4% of normal values can be a sign of the development of diseases such as influenza or pneumonia.

3.3 Perfusion index

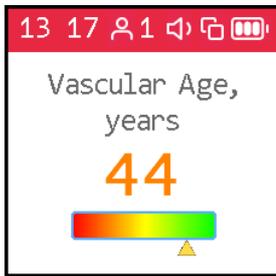


PI (Perfusion Index) - perfusion index, is a technical indicator. It reflects the level of the useful signal available for processing by the device. Values less than 1.0 indicate an insufficient signal level. The reason for this may be cold hands, too dark nail polish, pathology of the arteries. In this case, the test results may be unreliable.

If the filling index is less than 1.0, the device will issue a warning about the possible unreliability of the test results. Depending on the reason for the decrease in the perfusion index, it is possible to recommend:

- warm hands;
- turn the device so that the light of the sensor passes under the nail and not through it;
- change hand.

3.4 Vascular age

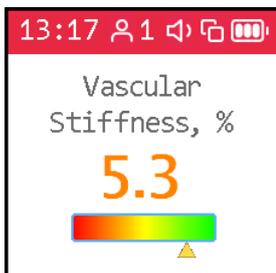


If your vascular age is less than the passport age, then this is good. A constant significant excess of the vascular age over the passport age may be a recommendation for consultation with a specialist. At the same time, you can note a decrease in vascular age against the background of an increase in blood pressure and pulse rate.

It is important to record this indicator at a certain time of the day, on the same hand, better the working one - right for a right-hander, left for a left-hander.

A good time to evaluate this indicator is considered to be the morning hours from 9 to 11.

3.5 Vascular stiffness



Here the sign in front of the number is important. If it is negative, then this rather indicates the preserved elasticity of the arteries. The greater the negative value of the stiffness percentage, the better the condition of the large arteries.

The normal values of this indicator depend on the age of the subject: in the age category from 18 to 35 years, a negative value from -40% to -5% is considered the norm. In the age category over 40 years, the norm ranges from -5% to 5%. For people older than 55 years, positive values of this indicator are typical. Of course, the ageing process is irreversible and inevitably leads to a gradual increase in vascular stiffness, but regardless of your age, you should strive to reduce the vascular stiffness index through a healthy lifestyle.

For a correct assessment of this indicator, it is necessary to first set the real age of the user in the device.

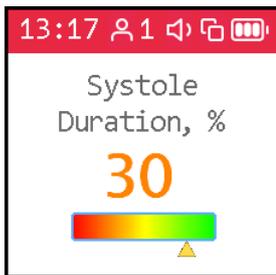
3.6 Pulse wave type

Pulse waves are divided into three types according to their shape.

Wave type C indicates a good condition of the arterial wall, type B indicates a satisfactory condition, and type A indicates an unsatisfactory condition. It is not uncommon to see more than one type of waves in a test. In this case, the higher the percentage of type C waves, the better.

- Wave type C is observed in young people up to 30 years old.
- Wave type B is observed in people over 40 years old, with a small probability of having health problems or temporarily in overworked conditions.
- Wave type A is observed in the elderly people over 55 years, but can also be encountered in younger people, with the likelihood of impairment or temporarily, with overworked conditions. In young people, wave A is often found in chronic sleep deprivation.

3.7 Systole duration



The ratio of systole duration to total cardiac cycle duration (ED%) reflects the characteristics of the myocardial work cycle.

Systole is the time of tension and work of the heart muscle, diastole is the time of relaxation, recovery, blood supply. The approximate ratio of systole to pulse wave length in the normal range is 1/3 or 33%. When the heart rate increases, the duration of the cardiac cycle shortens mainly due to diastole. Sometimes the systole duration increases up to 50% or more, entering the zone of myocardial instability. To assess this index, methods have been adopted to convert the systole duration to the value expected at a pulse rate of 60 beats per minute.

The ED% values are characterized by the following qualitative intervals:

- less than 25%: pronounced decrease of systole duration. Increased risk of complications;
- 25% - 29%: moderate decrease in systole duration. Tendency toward an increased risk of complications;
- 29% - 40%: normal systole duration;
- 40% - 43%: moderate excess of systole duration over normal. Decreased heartbeat stability, risk of arrhythmia.
- more than 43%: pronounced excess of systole duration over normal. Significant decrease in the heartbeat stability, increased risk of arrhythmia.

The boundaries of the assessment of this indicator for women can be shifted by +1%, for men by -1%. Or rely on the averages given.

Exceeding the systole duration is associated with a decrease in the heartbeat stability and increases the risk of arrhythmia. Sustained reduction in systole duration may accompany increased risks of cardiovascular complications.

Causes of systole duration exceeding the norm may be:

- Myocardial infarction;
- Reduced myocardial contractility;
- Enlargement of the left ventricular myocardium;
- Congenital peculiarities of the body;
- Certain medications taken;
- Alcohol abuse;
- Lack of potassium, magnesium;
- Low-protein diet.

3.8 Stress level



The indicator reflects the state of the centers that regulate the mode of operation of the body and the cardiovascular system in particular. Values less than 150 indicate a good, balanced state of regulation. Exceeding this threshold value indicates an excessive tension of regulatory mechanisms, and an index value of 900 or more indicates pronounced dysregulation.

The indicator is calculated based on the analysis of the distribution of the duration of pulse waves.

- 50 ... 150 - norm
- 150 ... 500 - stress, physical activity, fatigue, decrease in reserves with age
- 500 ... 900 - angina pectoris, psychophysiological fatigue, significant stress
- 900 ... 1500 - significant violation of regulatory mechanisms

Comment: With arrhythmias, serious violations of the respiratory function, this indicator is not applicable. The result obtained in this case gives a falsely low indicator of stress.

Chapter

IV

4 Working with a smartphone or a tablet

4.1 About the application

The **AngioCode** application is designed to control the **AngioCode-301** device. With it, you can:

- set up the device
- perform the test
- view the results of the current and previous tests
- save or delete test results
- get access to the cloud storage of results
- view trends of your results for the selected period of time

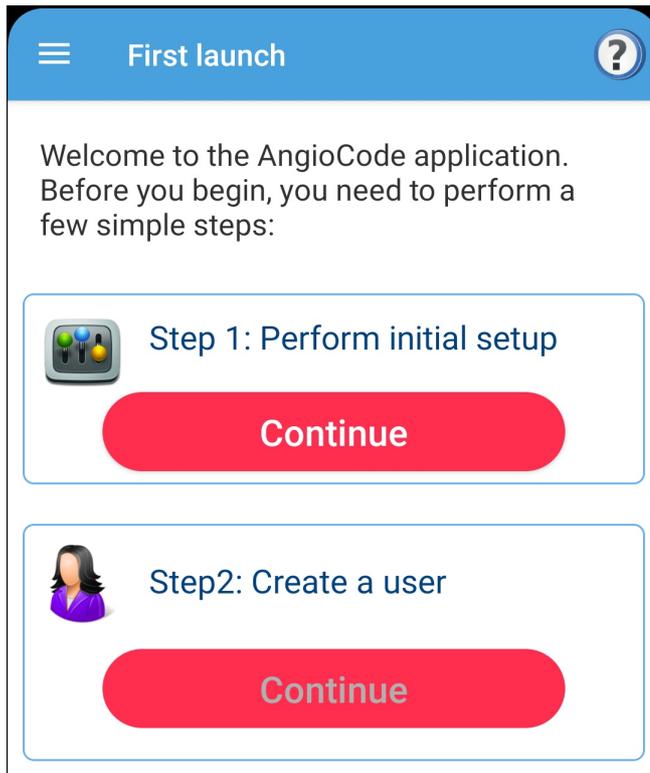
The **AngioCode-301** device itself is intended for independent monitoring of the state of the human body, in particular - the assessment of psycho-emotional balance, reserves of the cardiovascular system. The results are stored on a personal computer and can be transferred further for accumulation and analysis to the cloud storage.

Warning! AngioCode-301 is not a medical device! This is a device for monitoring physiological parameters at home. Any data obtained using the device is for informational purposes only and cannot be used for diagnosis, treatment or therapy. For all questions about the operation of the device, you can contact [Customer service https://angiocode.com/support](https://angiocode.com/support)

4.2 Quick start

Working with a phone/tablet

1. Install the AngioCode application on your phone from Google Play Market or by link https://angiocode.com/en_a301.
2. Open the application. At the first launch, you will be prompted to check the application settings and create the first user:

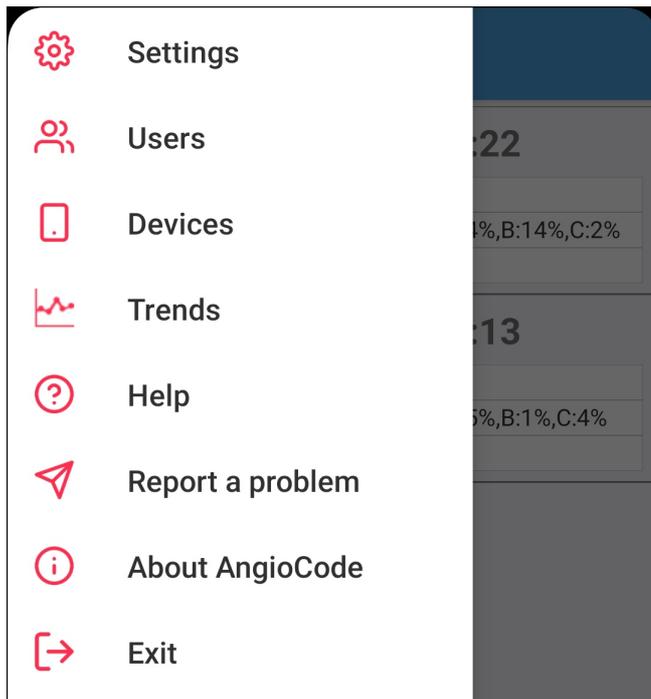


On the [settings screen](#) check that all options are set to the desired values and confirm with the “OK” button at the top of the screen. You can use the default settings for most cases.

After confirming the settings, the “Continue” button under the “Create a user” label becomes available. Select this button to create a device user and specify his/her data. The user editing page opens, where all fields are empty. Fill in all fields and click “OK” at the top of the screen.

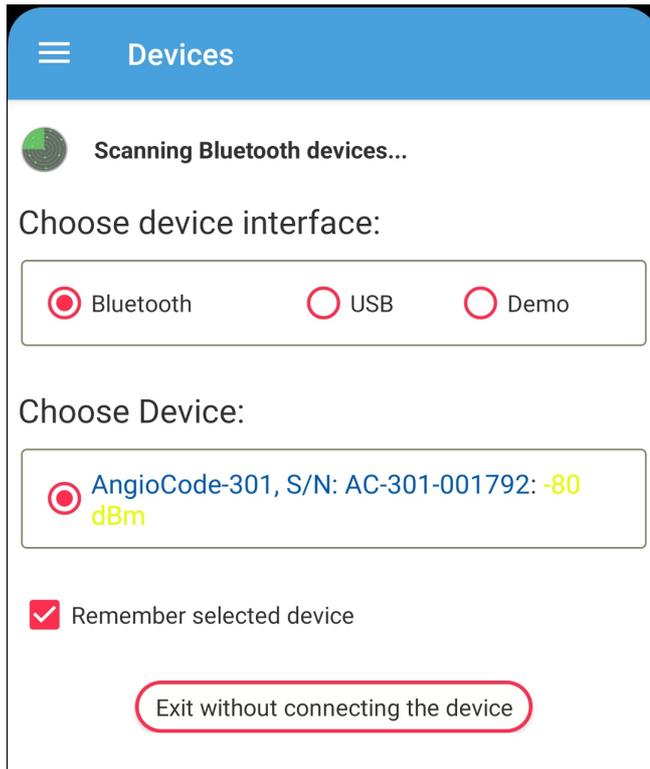
After the user is created, the program returns to the home page of the application. Before at least one test is done, this page will be blank.

3. Turn on the AngioCode-301 device. Make sure the battery of the device is not dead.
4. Select “Devices” the item in the application menu:



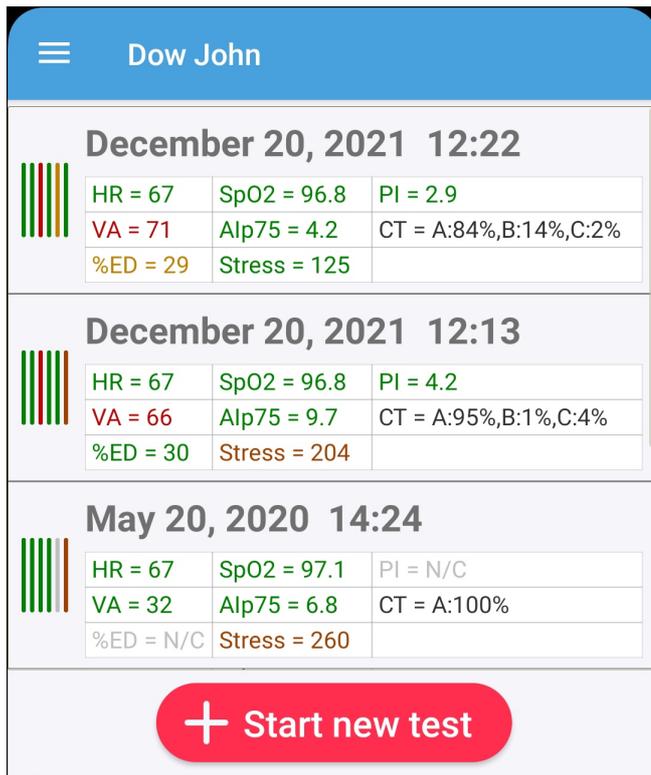
The device selection screen opens. Tap “Bluetooth”. If Bluetooth is not enabled on your phone, the program will prompt you to enable it. Confirm that you allow the application to enable Bluetooth. If your phone does not support Bluetooth version 4.0 (Android OS version is less than 5.1), a corresponding message will be displayed. It is not possible to operate the device with such phone via the Bluetooth interface.

Shortly, the name of the “AngioCode-301” device will appear in the “Select device” field. This means that the program has detected the device via the Bluetooth interface. Discovery may take some time. Leave the checkbox “Remember the selected device” enabled, and subsequently the program will contact the device automatically:



Confirm your choice with the “OK” button at the top of the screen.

6. Put the device on your finger as indicated in the documentation for the device.
7. Tap the green “Start new test” button at the bottom of the screen. You will be given a series of instructions on how to perform the test. Read these instructions carefully - it is really important to follow them in order for the test results to accurately reflect the state of your body.
8. Wait for the end of the test. Tap the “Results” button at the bottom of the screen. Graphical and textual information is displayed for each test parameter, see chapter [“How to evaluate your test results”](#).
9. Press the “Back” button on your phone (it’s a phone button, not an application button). The screen will display a list of tests performed, indicating the date and parameter values for each test:



To view the details of a test again, tap it in the list.

See the other chapters in this help document for information about additional features of the application.

Chapter



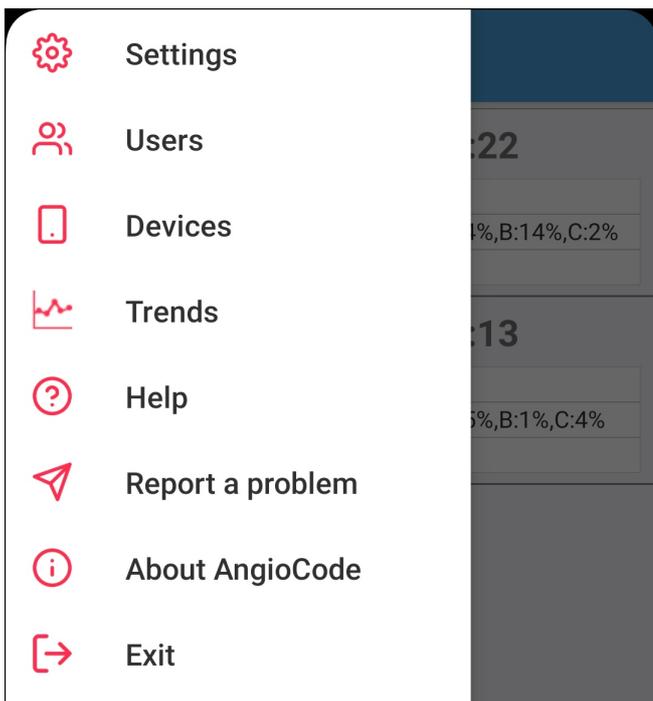
V

5 Application interface

This section contains a description of the **AngioCode** mobile application interface
In the upper left corner of the screen is the navigation menu icon:



This menu contains the main actions for working with the application:



Settings - go to the [program settings](#) page.

Users - displays a [list of device users](#) who are registered in the program.

Devices - go to the [AngioCode-301 device selection page](#).

Trends - displays [graphs of changes in test results](#). This menu item is available if more than three tests have been performed.

Help - display the table of contents of the help information. All help information is located in the program itself and does not require access to the Internet.

Report a problem - display a form for sending a message to the application developers.

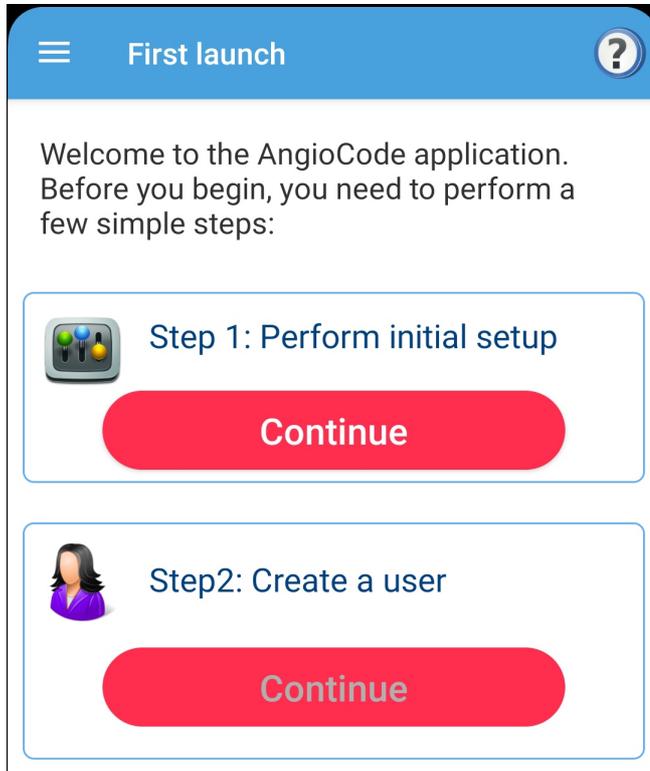
About AngioCode-301 - display information about the application and the device, if it is connected - the version of the application, the firmware version of the device, its serial number, etc.

Exit - exit the application. If the device is connected, it turns off and becomes available for work with a computer via USB.

The navigation menu is not always available. For example, during a test, you cannot perform any actions with the application, so the navigation menu is not available.

5.1 First launch

The first time you run the application, you are prompted to perform the initial setup and register the first user of the device:



Click the red “Continue” button. This opens the [application settings page](#), where you can set program options. You can use the default settings for most cases.

After confirming the settings, the button under “Create a user” label becomes available. Select this button to create a device user and specify his/her data. The user editing page opens, where all fields are empty. Fill in all fields and click “OK” at the top of the screen.

After the user is created, the program returns to the home page of the application. Before at least one test is done, this page will be blank. To start the first test, click the “Start new test” button at the bottom of the screen.

5.2 Home screen

The home screen of the application displays a list of tests performed with the device:



For each test, its date/time and result values are indicated:

PR - [pulse rate](#).

Alp75 - [vascular stiffness](#).

VA - [vascular aging](#).

CT - list of [pulse curve types](#). For each type, the number of waves of this type is displayed as a percentage of the total number of collected waves.

Stress - [stress index](#).

SpO2 - [blood oxygen saturation](#).

Quality - signal quality ([perfusion index](#)).

Level - signal level.

On the left, the result values are displayed as a color diagram. Color diagrams allow assessing visually the overall picture of the dynamics of changes in indexes.

Actions with the test list

Tapping the string with the test result opens a detailed view of the measured parameters - see links above.

Long tapping enables mark mode. Icons appear to the left of the results to mark multiple results:

December 20, 2021 12:22			
HR = 67	SpO2 = 96.8	PI = 2.9	
VA = 71	Alp75 = 4.2	CT = A:84%,B:14%,C:2%	
%ED = 29	Stress = 125		

December 20, 2021 12:13			
HR = 67	SpO2 = 96.8	PI = 4.2	
VA = 66	Alp75 = 9.7	CT = A:95%,B:1%,C:4%	
%ED = 30	Stress = 204		

May 20, 2020 14:24			
HR = 67	SpO2 = 97.1	PI = N/C	
VA = 32	Alp75 = 6.8	CT = A:100%	
%ED = N/C	Stress = 260		

You can perform the following actions with the marked tests:

- Delete
- View results as a table and share this table with anyone.

Check the required tests. To delete marked tests, click on the trash icon at the top of the screen. To view the results in a table, tap the options menu icon (three vertical dots) and select the appropriate item from the drop-down menu:

December 20, 2021 12:22			
HR = 67	SpO2 = 96.8	PI = 2.9	
VA = 71	Alp75 = 4.2	CT = A:84%,B:14%,C:2%	
%ED = 29	Stress = 125		

December 20, 2021 12:13			
HR = 67	SpO2 = 96.8	PI = 4.2	
VA = 66	Alp75 = 9.7	CT = A:95%,B:1%,C:4%	
%ED = 30	Stress = 204		

May 20, 2020 14:24			
HR = 67	SpO2 = 97.1	PI = N/C	
VA = 32	Alp75 = 6.8	CT = A:100%	
%ED = N/C	Stress = 260		

Mark all tests - tick marks appear for all tests.

Delete checked - delete marked tests after confirmation. The same action is performed by tapping the trash icon.

Table view - view the results in a table and share this table.

Cancel - all tests are unmarked and the icons to mark disappear. The same thing happens when you tap the back button on your phone.

Customizing the list view of test results

In the [application settings](#) you can select the elements that will be displayed in the tests list. You can disable the display of color diagrams and result values.

5.3 Settings

The settings are accessible through the navigation menu (the icon in the upper left corner of the screen). If the device is not connected to a phone/tablet, there will be no bookmark with the device settings.

5.3.1 Application

Application language - tap to select the application interface language. Russian language is available if it is supported by the mobile device.

Measurement system - Metric to enter user height in centimeters and weight in kilograms, English to enter user height in feet and inches and weight in pounds.

Enable cloud sync - see [Cloud sync](#).

Vibrate at the end of the test - since the test can take up to several minutes, it can be convenient to tell the device to vibrate when the test is completed.

Skip the “Test conditions” instruction dialogs - when tapping the “Start new test” button, immediately proceed to the test, skipping screens with instructions on the test conditions.

Rotate the screen horizontally, when viewing the conclusion - when viewing the conclusion on the test results, automatically rotate the screen horizontally. The horizontal orientation of the screen improves the readability of the conclusion.

Skip the “Test conditions” instruction dialogs - proceed to the actual test after entering blood pressure values, and skip the test recommendations.

Allow deletion of users and test results - when disabled, it blocks deletion of users and test results from accidental deletion attempts.

Delete successfully imported tests from the device memory - after establishing a connection with the device, the application automatically downloads from the device memory the test results that were performed using the device in offline mode (without connecting the device to a phone or computer). By default, after downloading, test results are deleted from the device memory to save space. Once deleted, results cannot be viewed offline without connecting the device to a phone or computer.

Show avatars in user list - display pseudo-random images with “portraits” of users in the user list of the device.

Show color diagrams in results list - display diagrams with vertical colored lines in the list of test results. The colors of the lines correspond to the values of the measured indexes. Color diagrams allow assessing visually the overall picture of the dynamics of changes in indexes.

Show values in results list - display the values of indexes in the list of test results. If the display of values is disabled, the list becomes more compact.

Diagnostic mode - enable extended output of information in the application log file. When a crash occurs, the extended log can help developers figure out the cause of the crash.

5.3.2 Device

Here you can set the AngioCode-301 device settings. This bookmark is available only when the device is connected. All settings are stored in the device itself and are also valid when the device is operating in offline mode, without connecting to a phone or computer.

The “**Users**” button opens the [list of device users](#), which are located in the device itself. These users are numbered from 1 to 9. Using this list, you can associate application users with device users, i.e. specify which application users correspond to which device users, as well as perform other actions.

Device language - sets the device interface language, i.e. the language of inscriptions on the device display.

Display orientation - rotate the image on the device display.

Display brightness - set the brightness of the device display.

Device sound:

Enable device sound enable/disable all sounds selected below at once. If this option is disabled, the device will not produce any sounds.

On/off sound - sound when the device is turned on and off.

Key sound - sound when pressing the keys on the device housing.

Sound during test - sounds during the test.

End test sound - sound at the end of the test.

Memory card - information about the device memory.

“**Format memory card**” button - after confirmation, erase the device memory by formatting. **All users and test results are lost.**

Synchronize device time with phone/tablet - when connecting the device to a phone/tablet, synchronize the time of the device with the time of the phone.

Turn off the device at the end of the test - you can enable this option to save the device battery power.

Turn off the device display when connected to a phone/tablet - also saves battery life of the device. When a connection with a phone/tablet is established, the device display turns off until the key on the device housing is pressed.

5.3.3 Expert

It is not recommended to change the expert settings of the application. This can cause the program to malfunction.

Change expert settings only after consultation with the developers of the application.

Number of pulse waves for the test - select the number of pulse waves that will be recorded before the test ends. To calculate the test parameters, 100 pulse waves are sufficient. A larger number somewhat increases the accuracy of the calculation of some parameters, in particular, [stress index](#).

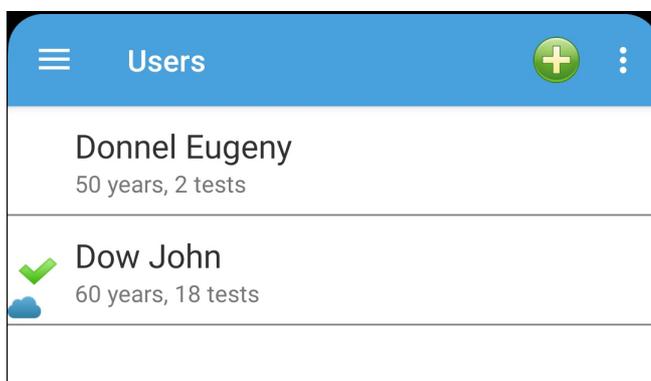
Minimal valid pulse index - minimal value of [perfusion index](#), at which the values of the indexes are considered reliable. The default value is 0.5%.

Scanning time for Bluetooth devices - maximum time the application waits for a response from the system to request the creation of a list of available Bluetooth devices. The default setting is 15 seconds. Under normal conditions, when the device is working properly, is close to the phone and there is no interference, the scanning of Bluetooth devices is much faster and there is no need to adjust the scanning time.

“Debug” group settings are related to the debugging information that is written to the application log file in diagnostic mode. Developers may ask you to enable a particular option in order to better understand the problem. By default, all of these options are disabled, because enabling them greatly increases the size of the log file and can affect the performance of the application. After enabling the debugging options, you should restart the application.

5.4 Users

The list of users is available via the navigation menu (icon in the upper left corner of the screen). Here you can select a user for testing, add a new user, import user from cloud storage and edit the data of an existing one.



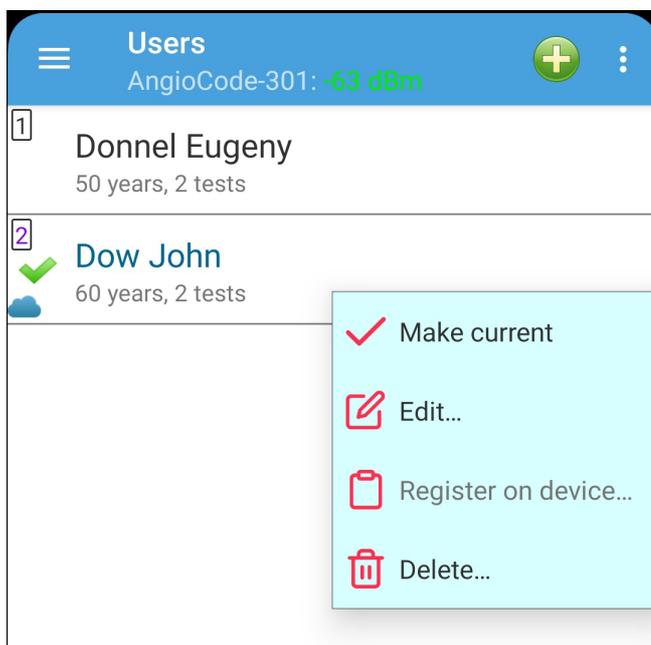
A pseudo-random “portrait” (avatar) is displayed to the left of the username. Avatar display can be disabled in [program settings](#). The current (selected for testing) user is marked with a check mark on the left.

If cloud sync is enabled for the user, then a cloud icon is displayed on the left. If the cloud is blue - synchronization is successful, if it is gray - then synchronization is not available under current conditions (for example, there is no Internet connection).

To **add** a user, tap the plus icon at the top of the screen. A page will open where you can enter the details of the new user.

It is also possible to **import user data** and test data from the cloud storage if the user was previously registered in the cloud from another phone or tablet. To do this, tap the icon with a cloud and an arrow at the top of the screen. You will be prompted to enter the username and password for the user you want to import. Next, a screen will open for entering user data - you will need to enter his last name, first name and middle name (at least one of these), because personal information is not stored in the cloud storage.

To go to actions with a user, tap his/her string in the list. A dropdown menu will open:



Make current - select this user for testing.

Edit - edit user data.

Register on device - if the AngioCode-301 device is connected to the phone, then you can assign a user number from 1 to 9, under which the user will appear when the device tests. To carry out tests, the user must be registered on the device. If this is not done here, then registration will be requested before the test.

Delete - delete user after confirmation. All user test results are also deleted.

5.4.1 Edit user data

The edit user data page is displayed when adding a new user from the [users list](#) and when editing the data of an existing user.

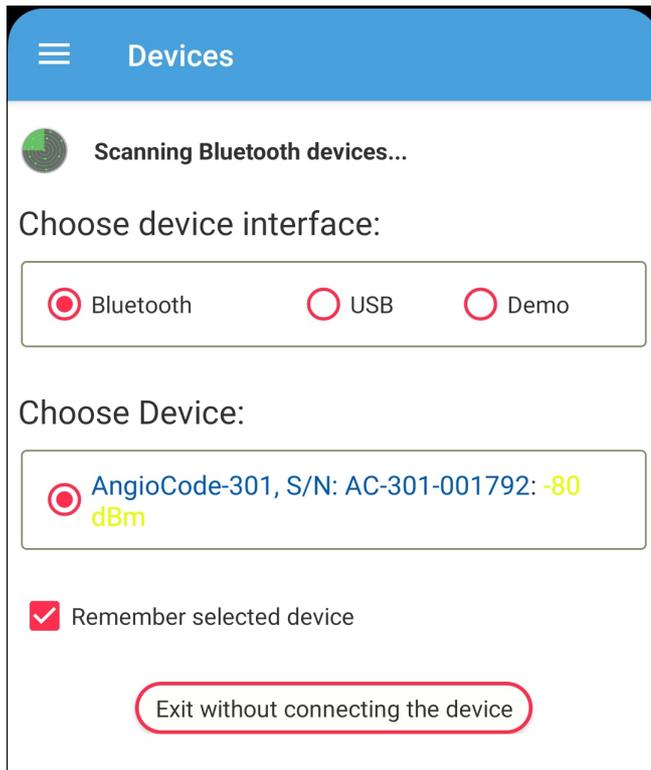
First name, last name, middle name - at least one of them has to be entered.

To enter a date of birth, tap the corresponding field. Date of birth, height and weight are necessary for the correct interpretation of the measurement results.

If the [cloud_sync](#) is enabled in the [program settings](#), then synchronization can be controlled individually for the selected user. If the synchronization is enabled, you will need to enter your login, password and email address (a new password will be sent to this address if you forget it).

5.5 Devices

Device selection is available via the navigation menu (icon in the upper left corner of the screen). The device selection page is displayed:



Work with devices connected to a mobile device via Bluetooth and USB interfaces is supported. By selecting “Demo”, you can get acquainted with the operation of the program in demo mode - this does not require a device. In demo mode, the program works with a virtual device.

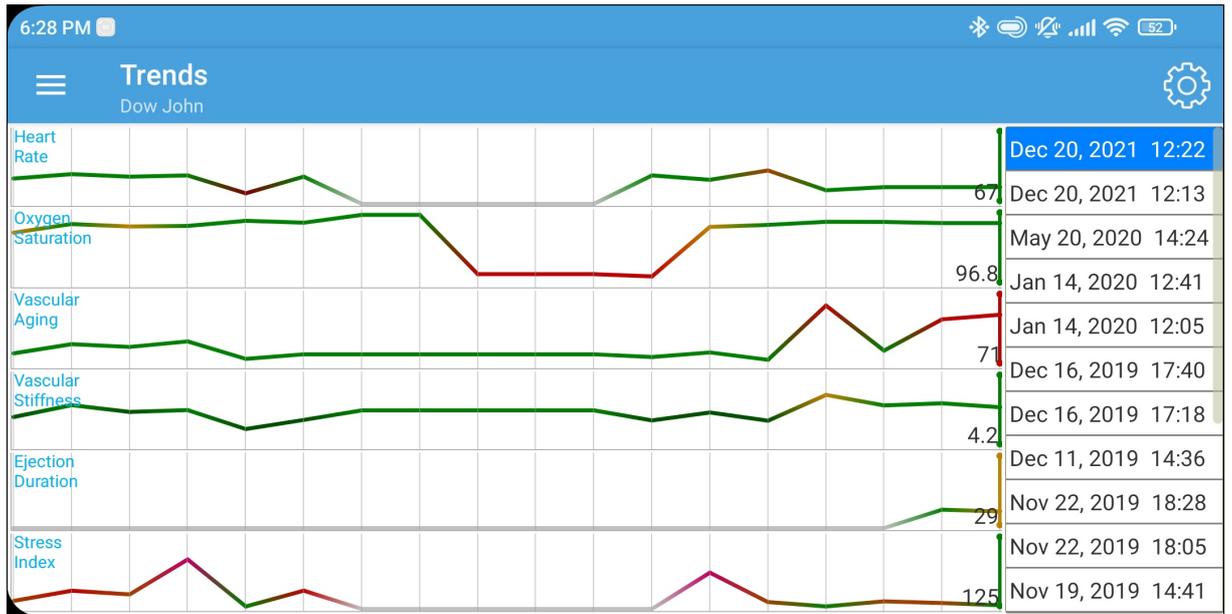
When you select an interface, the program scans the environment and detects devices available for connection. The “Select device” field displays a list of detected devices. In “Demo” mode, the virtual device is always available.

The **“Save selected device”** option tells the program not to display the device selection page before starting the test, if the selected device is turned on and the program was able to detect it.

After connecting the device via the Bluetooth the program takes some time to establish connection with the device and initialize it.

5.6 Trends

Trend graphs are available via the navigation menu (icon in the upper left corner of the screen). Graphs show the change in the measured parameters.



The list of test results is displayed on the right, the list can be scrolled vertically. The graphs display vertical lines corresponding to the test highlighted in blue. The value of the corresponding measured parameter is displayed next to the lines.

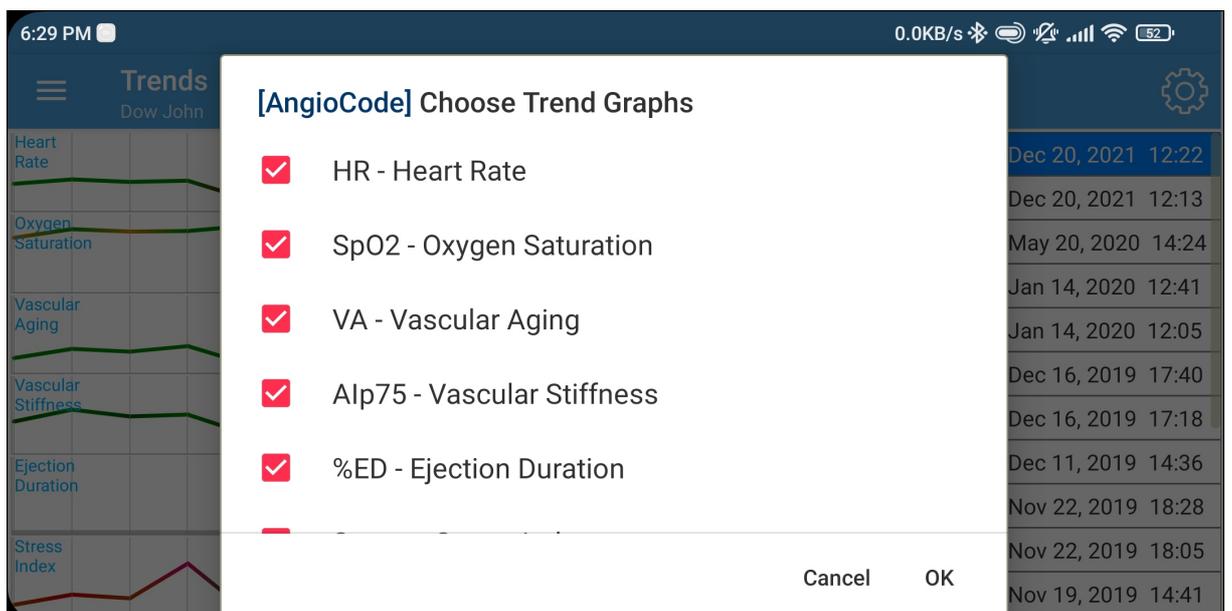
Tapping a result in the list moves the vertical lines to the location corresponding to the test.

A long tap on a result in the list opens a detailed view of test results.

Tapping the graph moves the vertical lines to the location corresponding to the tap, and in the list of tests, the corresponding test is highlighted in blue.

If there are too many test results to display at the same time, then the graphs can be scrolled horizontally.

The gear icon at the top of the screen opens a dialog box where you can select the parameters that will be displayed on the charts:



5.7 Feedback

A form opens where you can send a letter to developers with wishes or report errors in the program. You need to enter your name and email address, to which, if required, a response will be sent.

If you want to report a bug in the application to the developers, first make sure that the “Diagnostic mode” option is enabled in the [expert settings](#) . In diagnostic mode, the application creates an extended log file that can help developers. After enabling the diagnostic mode option, you need to restart the application.

If your message is not related to the operation of the user database, then uncheck “Include test database in the report”. This will slightly reduce the size of the message.

Chapter

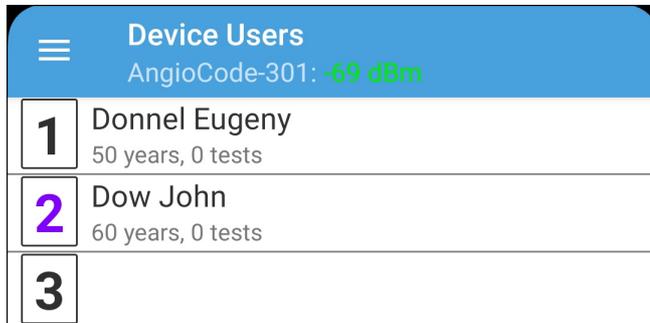


VI

6 Application screens

Various screens that the **AngioCode** application displays.

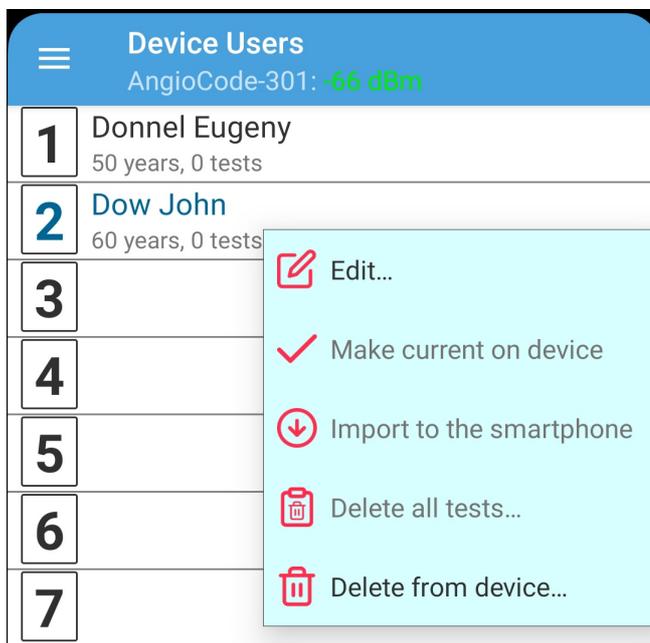
6.1 Device users



This is a list of users of the connected device - those users whose information is in the device itself. With these users, the device works in offline mode, i.e. when it is not connected to a computer or phone.

Users have numbers from 1 to 6. In the figure you can see that the users with numbers 1-4 have first and last names, and user number 6 has the characteristic name User6. This means that users 1-4 were logged into the device when the device was connected to a computer or phone. User number 6 was created by the device itself in offline mode when the device was not connected to a computer or phone.

Tap the user string to perform actions with the user:



Edit - [edit the data of the selected user](#). If the user is in the phone database, his/her data is stored in both the phone and the device. If the user is in the device, but is not in the phone database, the user data is changed only in the device.

Make current on the device - select the user to perform tests with the device in the offline mode. The number of the selected user is displayed in the status bar of the device:

Import to phone/tablet - transfer user data from the device to the phone. If necessary, the edit user data screen opens.

Delete all tests - delete user tests from the device memory to free up space.

Delete from the device - delete both user information and tests from the device memory.

Chapter



VII

7 How to evaluate your test results on a smartphone

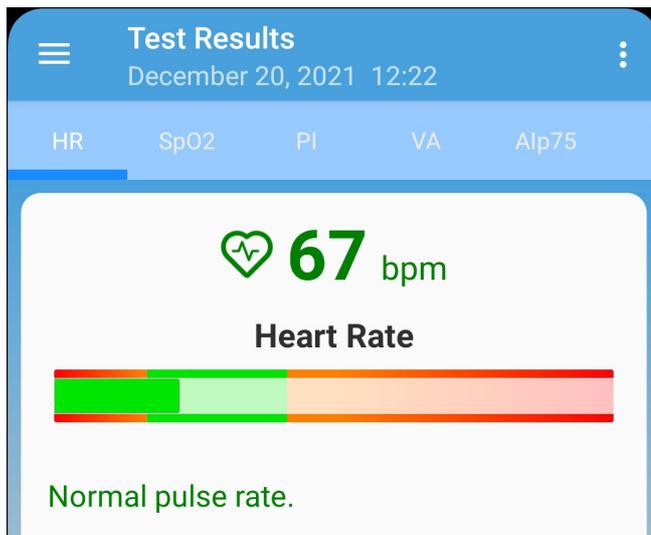
Based on the test results, the device generates scores for the following indexes:

- Pulse rate;
- Oxygen saturation;
- Perfusion index;
- Vascular age;
- Vascular stiffness;
- Pulse wave type;
- Systole duration;
- Stress level.

When displaying the results for each index, the device displays the score numerically and with a triangular arrow pointing to a section of the three-color scale. There are three evaluation options:

- green - good condition
- yellow - satisfactory condition
- red - unsatisfactory condition, if there are consistently negative results for some time, it is recommended to consult a specialist.

7.1 Pulse rate



Pulse rate or the number of heartbeats per minute. The inverse of this value is the pulse wave duration. The device evaluates the duration of each pulse wave, calculates the instantaneous value of the pulse frequency, and determines the average value based on the test results.

This is an important index, primarily reflecting the fitness of the body. The higher the resting heart rate, the less trained the body and the cardiovascular system in particular. For those who regularly exercise, the resting heart rate has values in the range of 55-60, which can be assessed as an excellent condition, 60-80 is good, more than 90 is bad.

A more reliable assessment of the fitness of the body can be obtained by conducting load tests.

As an option:

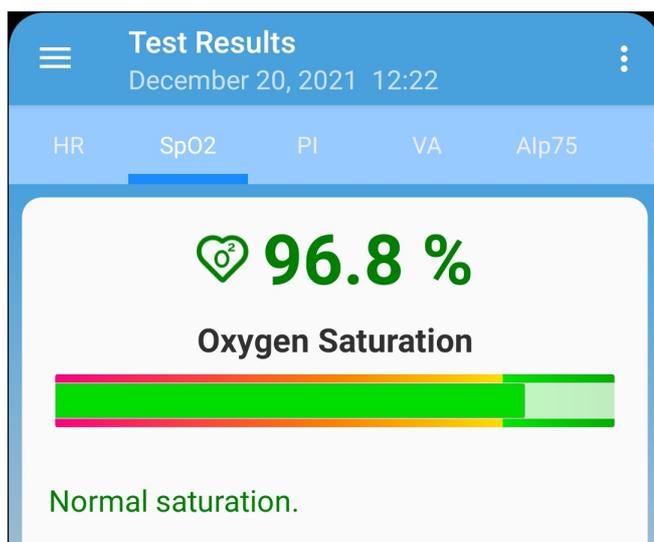
1. Determine the pulse rate in a normal resting state.
2. Do 20 squats in 30 seconds.

3. After 3 minutes, reassess heart rate and calculate the difference between the second and first results.

Result:

- good fitness - up to 5 beats;
- satisfactory - 5-10 beats;
- low - more than 10 beats.

7.2 Oxygen saturation



Oxygen, inhaled with atmospheric air, is transferred to the organs with the help of a special carrier protein - hemoglobin, which is contained in red blood cells, erythrocytes. The oxygen level in the blood or the oxygen saturation degree of the blood shows how much hemoglobin in the body is in a state associated with oxygen.

Oxygen saturation - saturation (SpO₂) of blood hemoglobin with oxygen is a vital index, the value of which is determined by:

- pumping function of the heart
- ability of the lungs to oxygenate the blood
- state of hemoglobin - oxygen carrier

Normally, almost all hemoglobin is associated with oxygen, while the hemoglobin saturation with oxygen varies in the range from 96% to 99%. A steady decrease in the level of saturation below 95% can be observed with disorders in the respiratory and cardiovascular systems, with severe anemia.

With chronic diseases of the heart and lungs, a decrease in this index may indicate an exacerbation of the disease, in such situation, one should seek medical help. A decrease in the level of saturation of hemoglobin with oxygen against the background of a cold, flu, acute respiratory viral infections, pneumonia and other lung diseases may indicate a complicated course of the disease.

The saturation level index is important for people with chronic lung diseases, including chronic bronchitis.

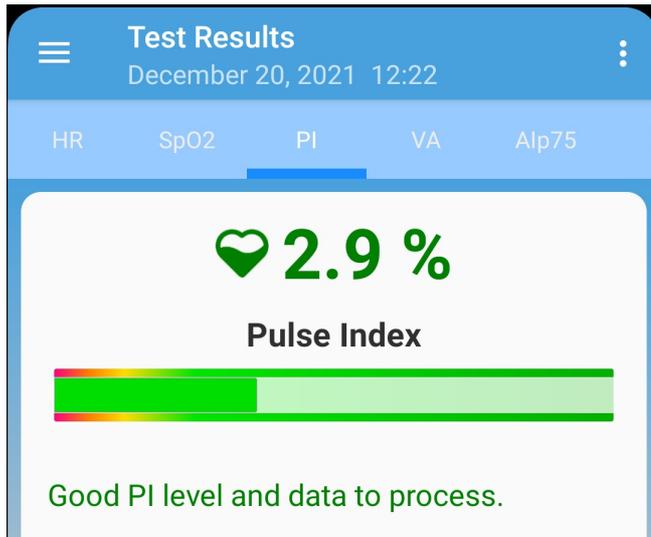
When performing a study, it should be taken into account that a number of factors can lead to an error in assessing the level of oxygen in the blood. Such factors include the presence of a manicure, especially with the use of dark shades of varnish, the movement of hands or trembling of the fingers during the examination, the presence of a strong external light source - solar or artificial, and the close proximity of

sources of strong electromagnetic radiation, such as mobile phones. The low temperature in the study room can also lead to errors in the SpO₂ assessment.

There may be slight individual fluctuations in the saturation level. To correctly interpret the score for this index, several tests should be performed. This will reveal the individual characteristics of fluctuations in the level of oxygen in the blood, and will help to correctly interpret certain changes in the future.

A sharp decrease in SpO₂ by 3-4% of normal values can be a sign of the development of diseases such as influenza or pneumonia.

7.3 Perfusion index

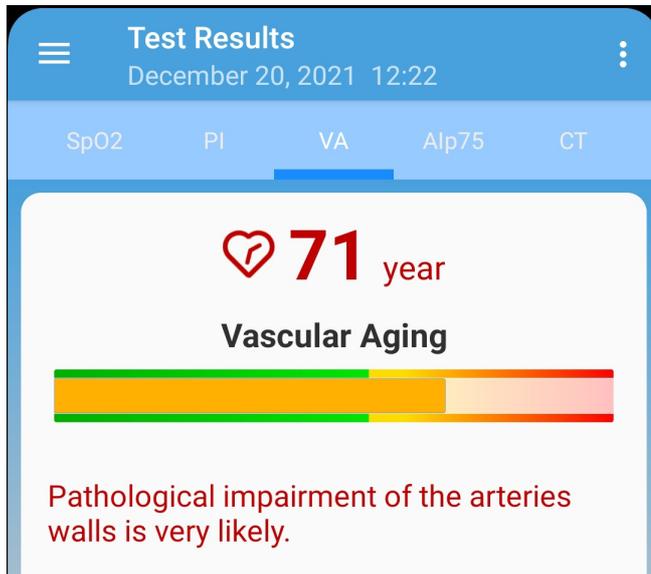


PI (Perfusion Index) - perfusion index, is a technical one. It reflects the level of the useful signal available for processing by the device. Values less than 1.0 indicate an insufficient signal level. The reason for this may be cold hands, too dark nail polish, pathology of the arteries. In this case, the test results may be unreliable.

If the filling index is less than 1.0, the device will issue a warning about the possible unreliability of the test results. Depending on the reason for the decrease in the perfusion index, it is possible to recommend:

- warm hands;
- turn the device so that the light of the sensor passes under the nail and not through it;
- change hand.

7.4 Vascular age

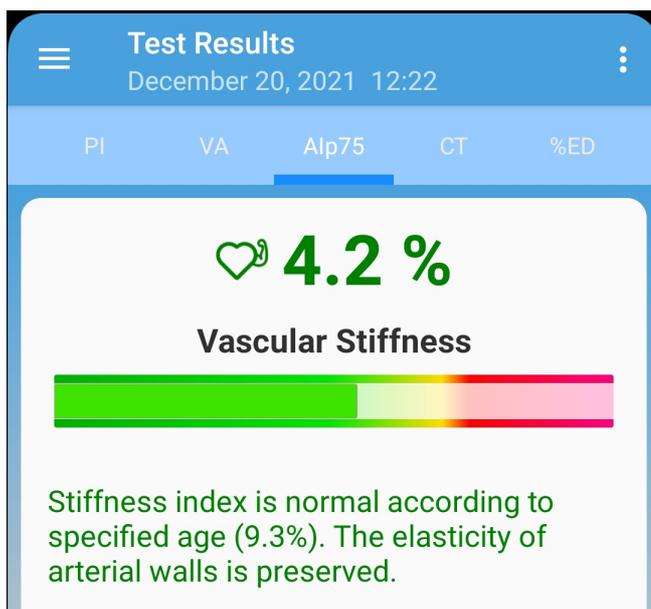


If your vascular age is less than the passport age, then this is good. A constant significant excess of the vascular age over the passport age may be a recommendation for consultation with a specialist. At the same time, you can note a decrease in vascular age against the background of an increase in blood pressure and pulse rate.

It is important to record this index at a certain time of the day, on the same hand, better the working one - right for a right-hander, left for a left-hander.

A good time to evaluate this index is considered to be the morning hours from 9 to 11.

7.5 Vascular stiffness

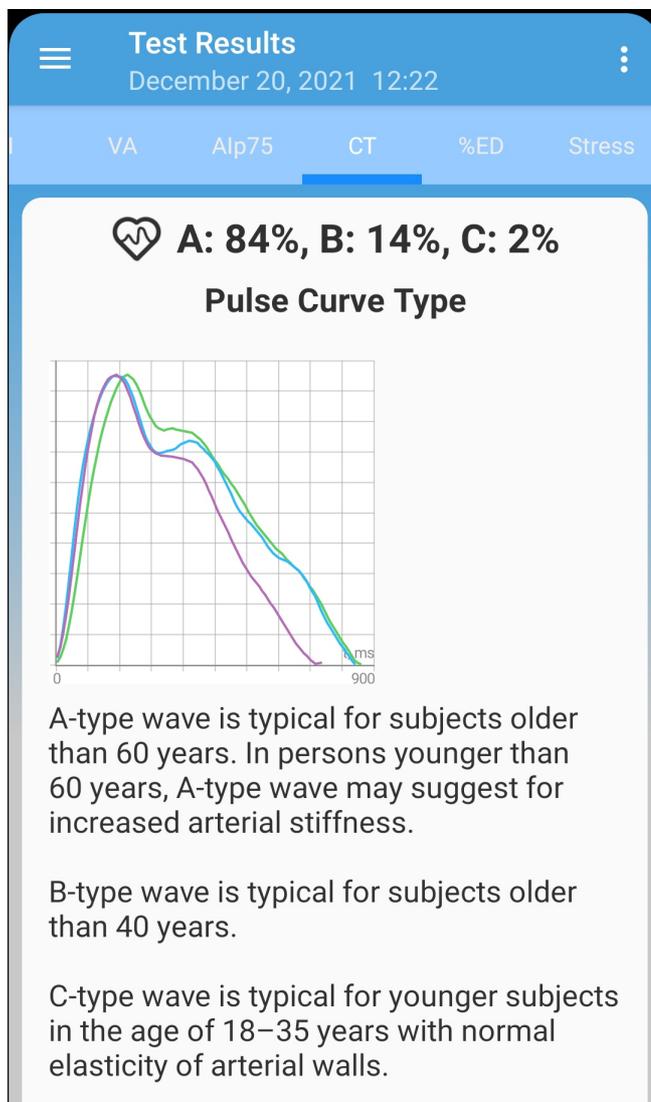


Here the sign in front of the number is important. If it is negative, then this rather indicates the preserved elasticity of the arteries. The greater the negative value of the stiffness percentage, the better the condition of the large arteries.

The normal values of this index depend on the age of the subject: in the age category from 18 to 35 years, a negative value from -40% to -5% is considered the norm. In the age category over 40 years, the norm ranges from -5% to 5%. For people older than 55 years, positive values of this index are typical. Of course, the aging process is irreversible and inevitably leads to a gradual increase in vascular stiffness, but regardless of your age, you should strive to reduce the vascular stiffness index through a healthy lifestyle.

For a correct assessment of this index, it is necessary to first set the real age of the user in the device.

7.6 Pulse wave type

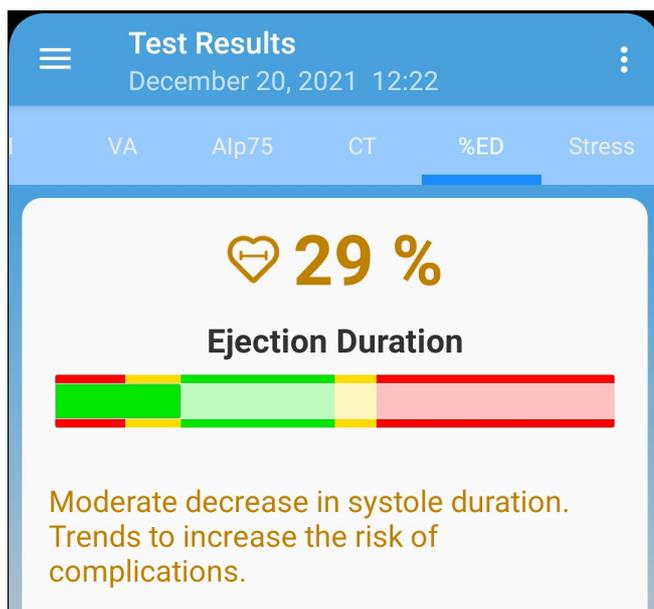


Pulse waves are divided into three types according to their shape.

Wave type C indicates a good condition of the arterial wall, type B indicates a satisfactory condition, and type A indicates an unsatisfactory condition. It is not uncommon to see more than one type of curves in a test. In this case, the higher the percentage of type C waves, the better.

- Wave type C is observed in young people up to 30 years old.
- Wave type B is observed in people over 40 years old, with a small probability of having health problems or temporarily in overworked conditions.
- Wave type A is observed in the elderly people over 55 years, but can also be encountered in younger people, with the likelihood of impairment or temporarily, with overworked conditions. In young people, wave A is often found in chronic sleep deprivation.

7.7 Systole duration



The ratio of systole duration to total cardiac cycle duration (ED%) reflects the characteristics of the myocardial work cycle.

Systole is the time of tension and work of the heart muscle, diastole is the time of relaxation, recovery, blood supply. The approximate ratio of systole to pulse wave length in the normal range is 1/3 or 33%.

When the heart rate increases, the duration of the cardiac cycle shortens mainly due to diastole.

Sometimes the systole duration increases up to 50% or more, entering the zone of myocardial instability. To assess this index, methods have been adopted to convert the systole duration to the value expected at a pulse rate of 60 beats per minute.

The ED% values are characterized by the following qualitative intervals:

- less than 25%: pronounced decrease of systole duration. Increased risk of complications;
- 25% - 29%: moderate decrease in systole duration. Tendency toward an increased risk of complications;
- 29% - 40%: normal systole duration;
- 40% - 43%: moderate excess of systole duration over normal. Decreased heartbeat stability, risk of arrhythmia.
- more than 43%: pronounced excess of systole duration over normal. Significant decrease in the heartbeat stability, increased risk of arrhythmia.

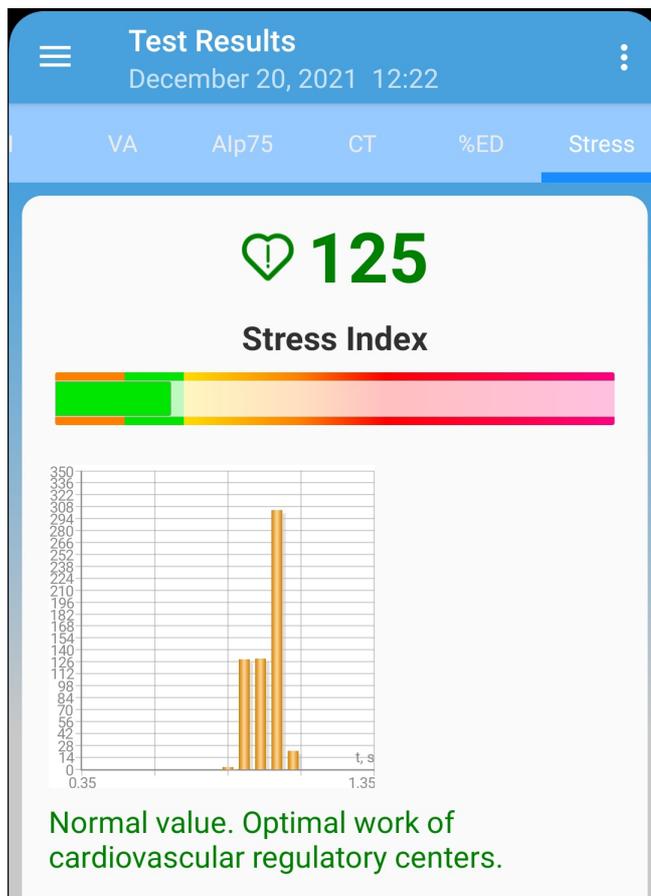
The boundaries of the assessment of this index for women can be shifted by +1%, for men by -1%. Or rely on the averages given.

Exceeding the systole duration is associated with a decrease in the heartbeat stability and increases the risk of arrhythmia. Sustained reduction in systole duration may accompany increased risks of cardiovascular complications.

Causes of systole duration exceeding the norm may be:

- Myocardial infarction;
- Reduced myocardial contractility;
- Enlargement of the left ventricular myocardium;
- Congenital peculiarities of the body;
- Certain medications taken;
- Alcohol abuse;
- Lack of potassium, magnesium;
- Low-protein diet.

7.8 Stress level



The index reflects the state of the centers that regulate the mode of operation of the body and the cardiovascular system in particular. Values less than 150 indicate a good, balanced state of regulation. Exceeding this threshold value indicates an excessive tension of regulatory mechanisms, and an index value of 900 or more indicates pronounced dysregulation.

The index is calculated based on the analysis of the distribution of the duration of pulse waves.

- 50 ... 150 - norm
- 150 ... 500 - stress, physical activity, fatigue, decrease in reserves with age
- 500 ... 900 - angina pectoris, psychophysiological fatigue, significant stress
- 900 . 1500 - significant violation of regulatory mechanisms

Comment: With arrhythmias, serious violations of the respiratory function, this index is not applicable. The result obtained in this case gives a falsely low index of stress.

Chapter

VIII

8 Cloud sync

AngioCode diagnostic complexes provide the possibility to synchronize user data and test results with cloud storage. The synchronization scheme is very similar to the scheme used by mobile phones to synchronize contacts and other account data. When synchronization is enabled, the data of registered users and the results of their tests will be the same on all computers and mobile devices where these users are present. In the context of synchronization, a user is a person entered into the database on the device. Internet access is required for synchronization. The amount of data that transferred during synchronization is small.

Each user of the program is registered in the **AngioCode** cloud database separately, i.e. has its own username and password. Synchronization of test results data is performed only for registered users. **AngioCode** can be registered either directly from the program or via the <https://www.angiocode.com> website.

Personal information of users, namely last name, first name and middle name, is not stored in the cloud. Only the username and password are used to identify users.

You can disable synchronization for all users at once (in [program settings](#)), and for each separately.

Chapter

IX

9 Working with a computer

This section describes the AngioCode dialog boxes and windows.

9.1 Installation of the AngioCode software

Several AngioCode software versions can be installed on one computer at the same time. Software updates are available via the Internet.

When installing the updated software, the installer determines which versions of the AngioCode software is already installed on the computer and offers to transfer the desktop environment from the existing version to the version to be installed. The desktop environment includes AngioCode configuration files. The user database is the same for all versions of AngioCode, it is not replaced when installing a new version and is not removed when uninstalling it.

Next, you will be prompted to uninstall old versions of the AngioCode software from your computer:

9.1.1 Installation of the USB driver

When installing the AngioCode program, the driver is installed automatically. If the installation fails, the driver installer window remains on the screen.

The AngioCode device may or may not be connected to a computer. It is still preferable to connect the device *after* installing the package (respectively, the driver), because in this case the operating system will not display the dialog boxes “Found new equipment...”. If the device was connected before the package was installed and the “Found new equipment...” dialog box appeared, it should be closed without performing any actions.

When connecting a USB device after installing the driver, it will take some time (several seconds) for the system to initialize the parameters associated with the device. During this time, the device will not work yet.

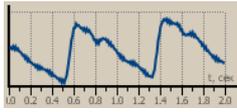
If the system already has a driver installed, the system checks its version. If the installed driver has a later version than the one being installed, then the system does not perform any action, otherwise the installed driver will be updated.

Usually, after installing the driver, rebooting the system is not required. However, if such a need arises, you will be prompted to reboot the system.

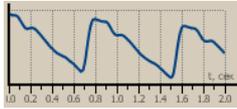
The driver installer is also available after installing the package - in the AngioCode folder there is a label “USB Device Driver Installer”. If you encounter problems installing the driver, this installer will help you solve them.

9.2 Using AngioCode with a laptop

If the AngioCode device is connected to a notebook, tablet or netbook, it must be borne in mind that the notebook's power supply often creates strong interference with the device's photosensor:



Sensor signal in the presence of interference



Sensor signal without interference

Interference to the sensor signal is likely to reduce the reliability of the test results, therefore, when testing with a notebook, it is recommended to disconnect its power supply from the mains. **Please note that you should unplug the power supply from the wall socket, and not from the notebook.** If it is impossible to disconnect the notebook from the network, then you should place its power supply and wires as far as possible from the AngioCode device and its cable.

In the [AngioCode](#) settings there is an option “Display warning before test start if notebook is connected to the power outlet”. By default, this option is enabled, and a warning is issued before the start of the test (working on a notebook connected to the network is automatically recognized by the program).

9.3 Synchronizing with the Internet

The AngioCode device provides the ability to synchronize user data and test results with a cloud storage. The synchronization scheme is very similar to the scheme used by mobile phones to synchronize contacts and other account data. When synchronization is enabled, the data of registered users and the results of their tests will be the same on all computers where these users are present. In the context of synchronization, a user is understood as an individual registration record entered into a database on a computer.

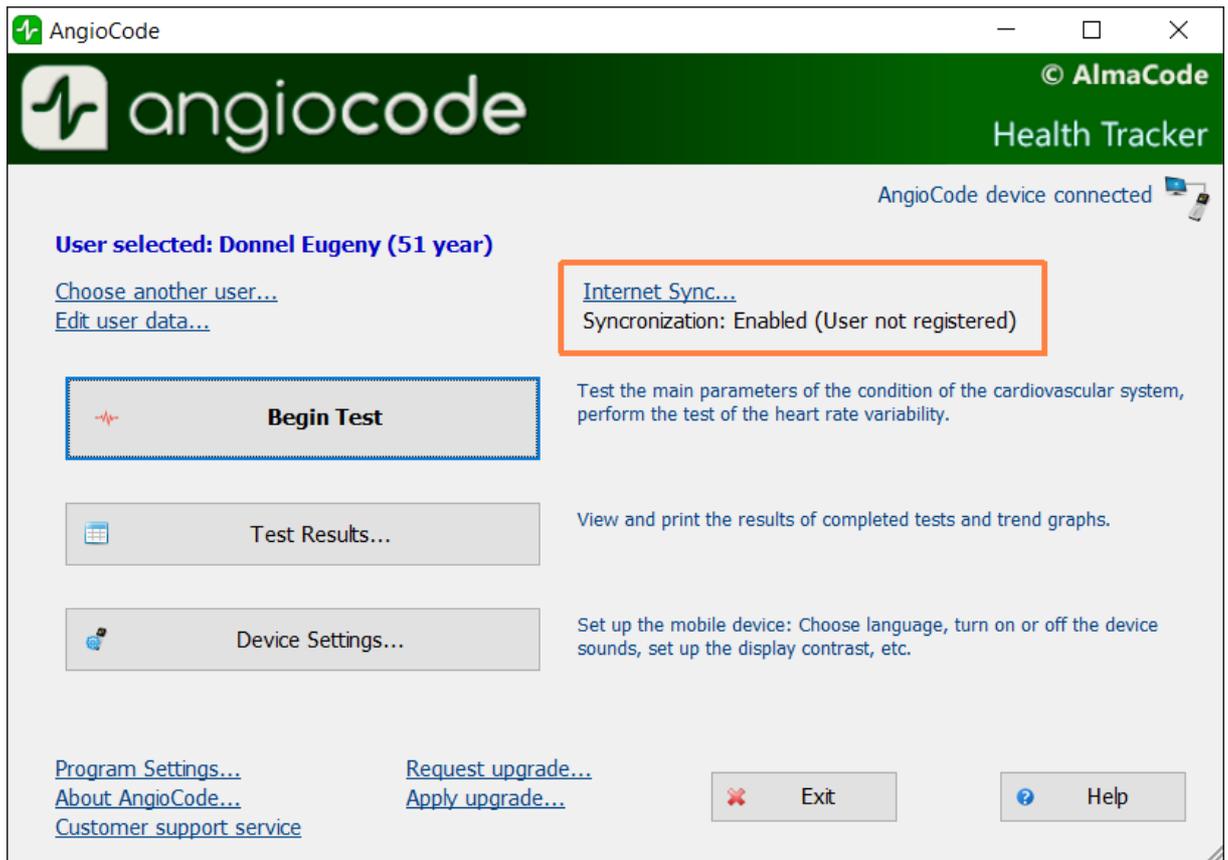
Each user of the program is registered in the AngioCode cloud database separately, i.e. has its own username and password. Synchronization of test results data is performed only for registered users. The AngioCode user can be registered either directly from the AngioCode program or via the <https://www.angiocode.com> website.

Personal information of users, namely last name, first name and middle name, is not stored in the cloud. Only the username and password are used to identify users.

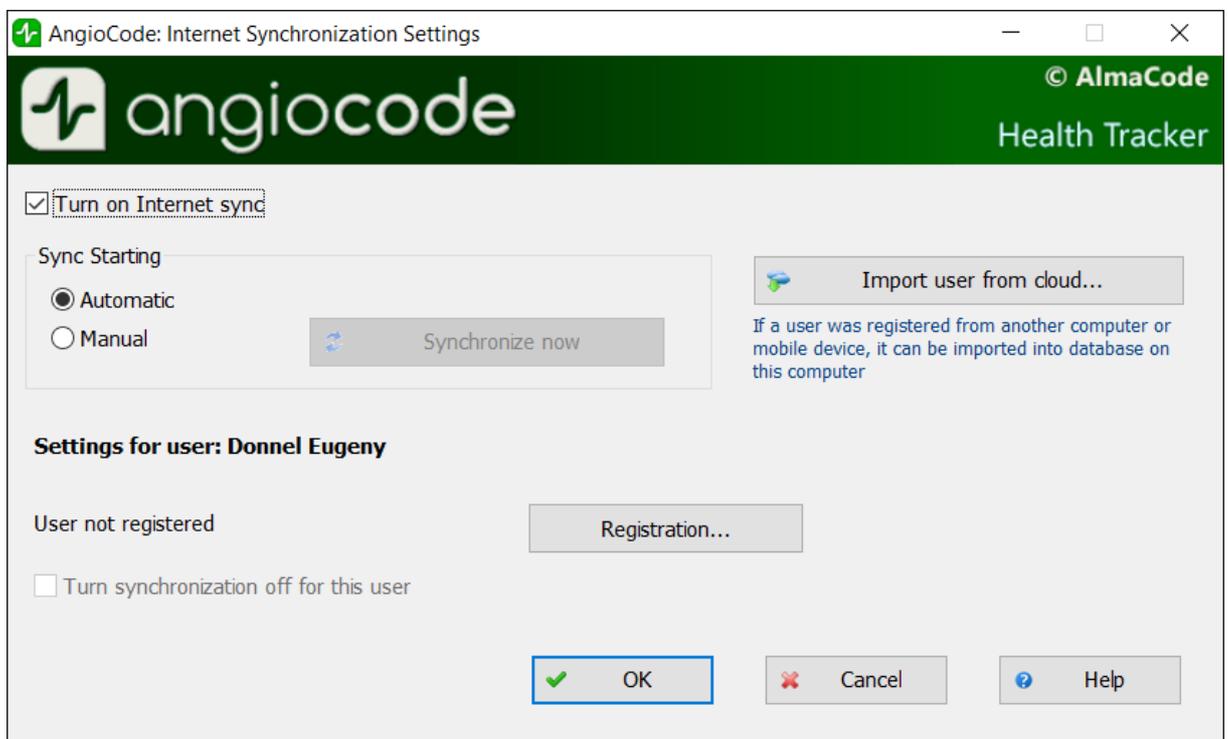
You can disable synchronization both for all users at once, and for each separately.

Cloud synchronization management

The [program's home dialog box](#) displays the synchronization status:



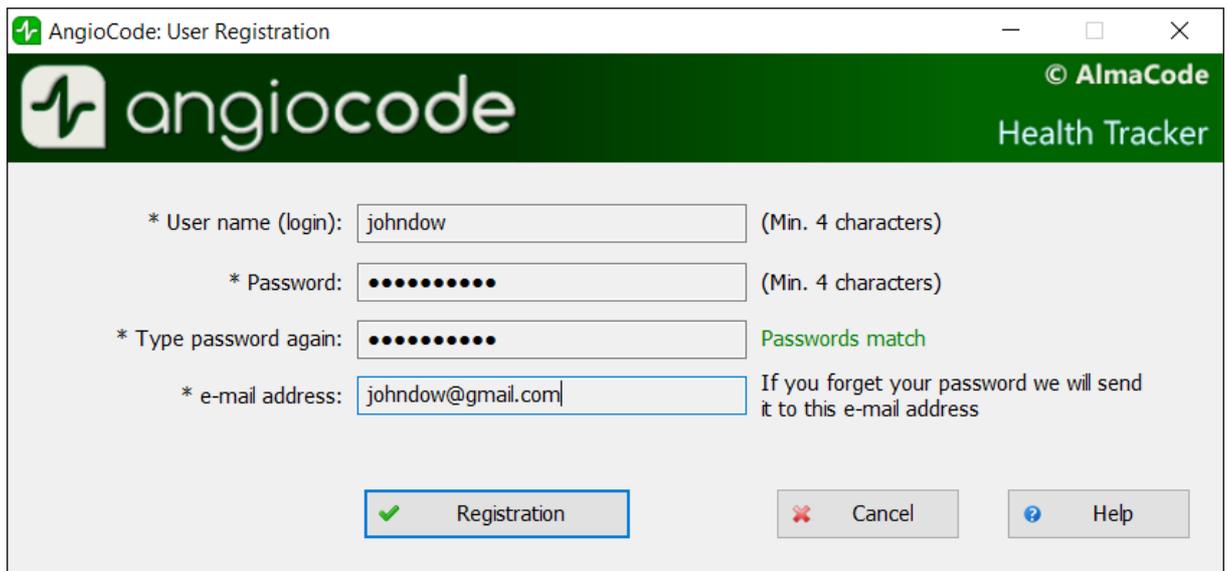
Selecting the "Internet synchronization" link opens the synchronization settings dialog box:



The "Turn on Internet sync" option controls the overall synchronization state. When synchronization is disabled, the program does not make any attempts to access the cloud storage.

The settings of the “**Sync starting**” group control how synchronization is started: when automatically started, synchronization is performed after any changes in the local database (adding, changing, deleting users and test results). Since synchronization is performed in the background, and the amount of data being transferred is relatively small, you should switch to manual synchronization only with paid Internet traffic or a slow connection.

Below are the settings for the current user. If there is no user registration, you can register it with the “**Registration**” button:



The screenshot shows a window titled "AngioCode: User Registration" with a green header bar containing the AngioCode logo and "© AlmaCode Health Tracker". The main area contains four input fields with asterisks indicating they are required:

- * User name (login): (Min. 4 characters)
- * Password: (Min. 4 characters)
- * Type password again: Passwords match
- * e-mail address: If you forget your password we will send it to this e-mail address

At the bottom, there are three buttons: "Registration" (with a green checkmark icon), "Cancel" (with a red X icon), and "Help" (with a blue question mark icon).

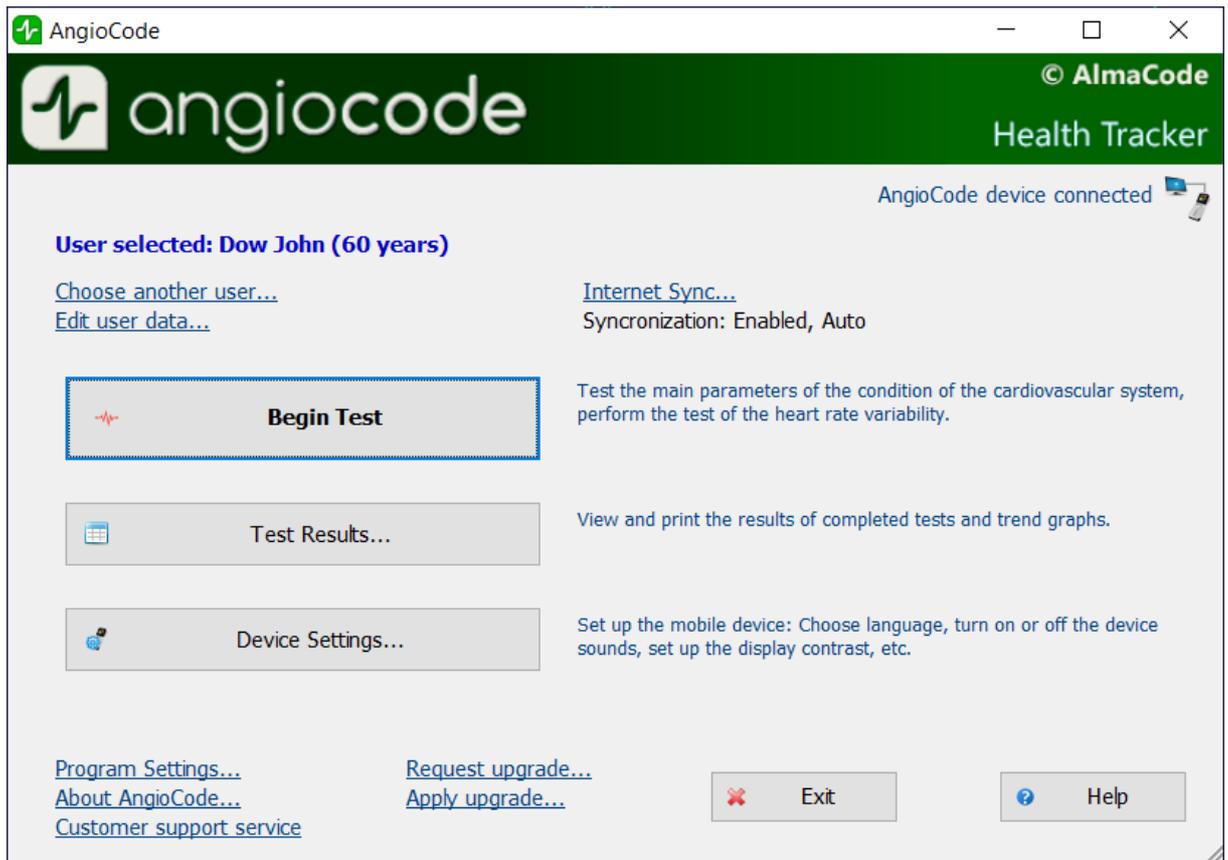
You can also register through the <https://www.angiocode.com> program website. On the website, you can view test results, graphs of trend indicators, etc.

The “**Turn synchronization off for this user**” option controls the synchronization state for this particular user.

The “**Import user from cloud**” button allows adding to the local database a user who was registered on another computer, mobile device, or through the program website. You are prompted to enter the username and password of this user. After checking the correctness of the input, you will be prompted to enter for the imported user his first name, last name, middle name, because no personal information is stored in the cloud (the rest of the data - date of birth, sex, etc. is copied from the cloud). Then the test results are loaded into a local database and subsequently synchronized in the same way as for other users.

9.4 Home dialog box

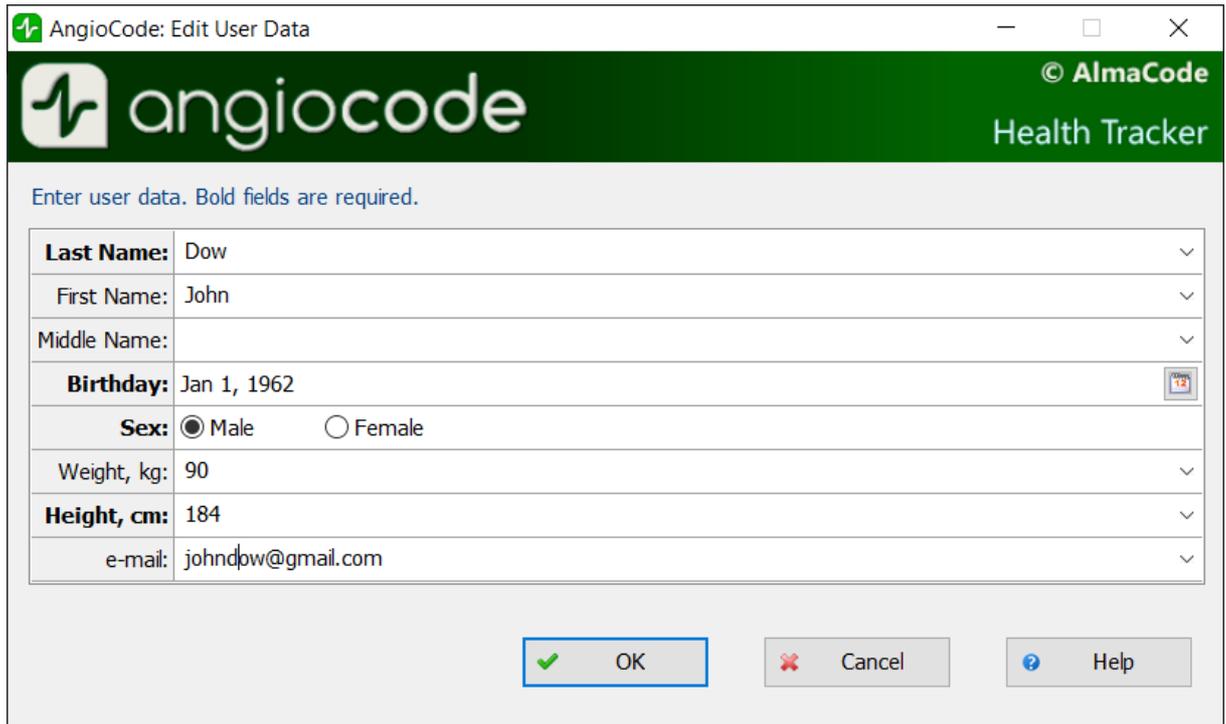
This dialog box is displayed on the AngioCode startup.



The AngioCode device status is displayed in the upper right corner of the dialog box. To install the device's USB driver, see ["Installing AngioCode software"](#).

The **"Choose another user"** link opens the ["Choose the user"](#) dialog box. Use this dialog box to select another user from the database, as well as to add a new user or delete an existing one.

The **"Edit user data"** link opens a dialog box of the same name where you can specify user data: Full name, date of birth, height, etc.:



Enter user data. Bold fields are required.	
Last Name:	Dow
First Name:	John
Middle Name:	
Birthday:	Jan 1, 1962
Sex:	<input checked="" type="radio"/> Male <input type="radio"/> Female
Weight, kg:	90
Height, cm:	184
e-mail:	johndow@gmail.com

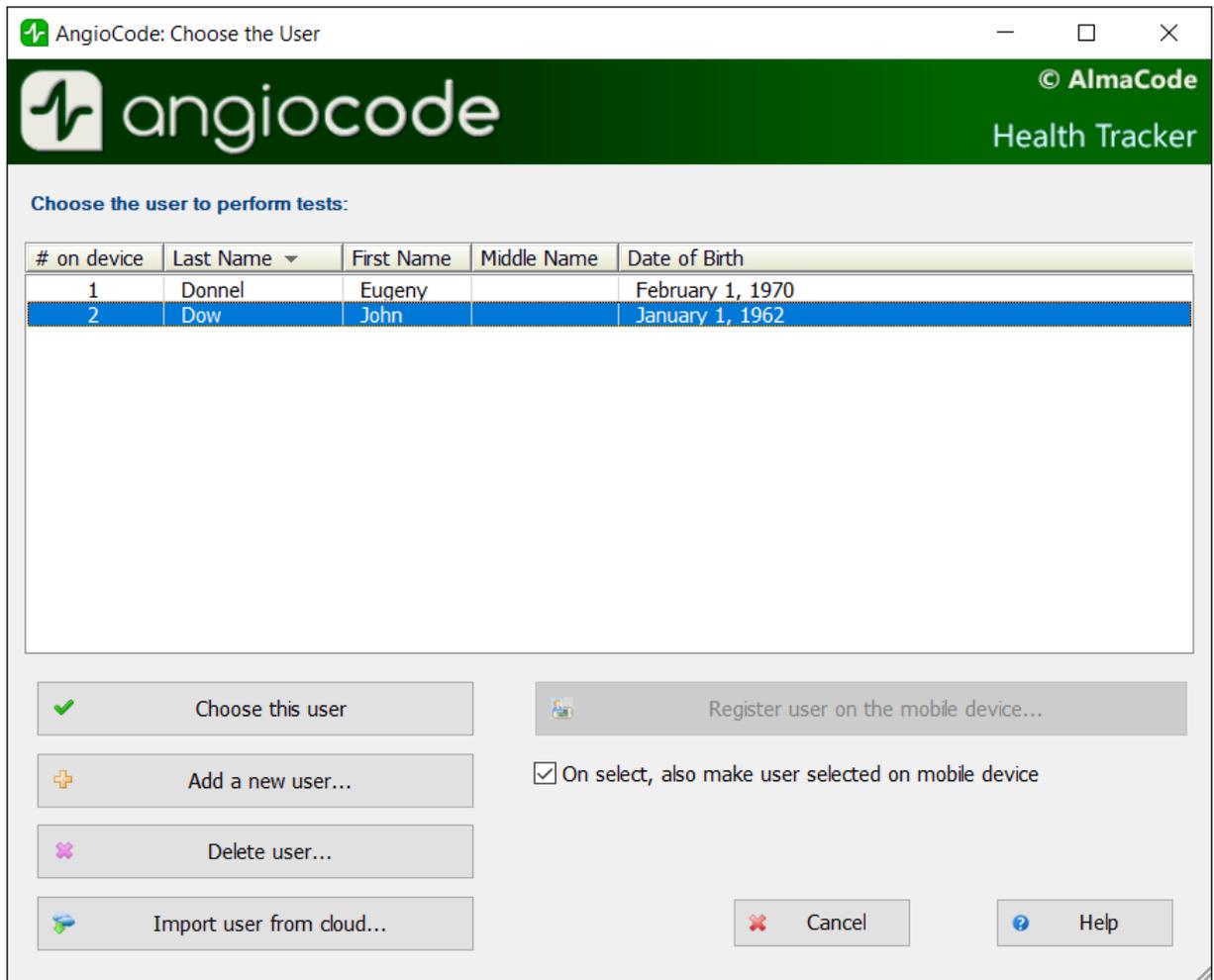
The “**Begin test**” button is available when the device is connected to the computer. Before the start of the test, a series of dialog boxes is given with instructions on how to conduct the test.

The “**Test results**” button displays the “[Test results](#)” dialog box. Using this dialog box, you can view the results of the tests performed, get detailed information about each test, print a medical report, delete unnecessary results, etc.

The “**Program settings**” link opens the [settings dialog box](#), where you can set AngioCode parameters.

9.5 “Selecting a user to work with” dialog box

Use this dialog box to select another user from the database, as well as to add a new user or delete an existing one.



The **“Import user from cloud”** button opens a dialog box where you can enter the login and password of the user who was registered in the AngioCode cloud storage to the local database from another computer or mobile device. See [Internet sync](#).

You can only delete a user explicitly in the “Choose the user” dialog box, and you can delete test results in the [“Test results”](#) dialog box.

9.6 “Test results” dialog box

Using this dialog box, you can view the results of the tests, get detailed help about each test, print a final report, delete unnecessary results, etc. Note that this dialog box can be resized just like any Windows window.

AngioCode: Test Results

© AlmaCode Health Tracker

Dow John (60 years)

#	Date	Heart Rate	Oxygen Saturation	Pulse Index	Vascular Aging	Vascular stiffness	Pulse Curve Type	Ejection Duration, %	Stress In
1	Jan 13, 2022 16:48	61	97.2	2.0	N/C	11.3	A:100	29	371
2	Dec 20, 2021 12:22	67	96.8	2.9	71	4.2	A:84,B:14,C:2	29	125
3	Dec 20, 2021 12:13	67	96.8	4.2	66	9.7	A:95,B:1,C:4	30	204
4	May 20, 2020 14:24	67	97.1	0	N/C	6.8	A:100	N/C	260
5	Jan 14, 2020 12:41	62	97.1	0	N/C	21.0	A:100	N/C	89
6	Jan 14, 2020 12:05	94	96.3	0	N/C	-14.1	C:100	N/C	236
7	Dec 16, 2019 17:40	79	95.8	0	N/C	-2.9	A:5,B:33,C:62	N/C	1235
8	Nov 13, 2019 16:26	84	96.9	0	N/C	-13.0	C:100	N/C	624
9	Sep 20, 2019 15:27	57	97.4	0	N/C	-25.3	B:5,C:95	N/C	87
10	Jul 16, 2019 13:32	86	96.0	0	N/C	0.3	B:14,C:86	N/C	1682
11	Jun 21, 2019 10:41	84	95.9	0	N/C	-2.2	B:24,C:76	N/C	498
12	Jun 21, 2019 10:29	88	96.5	0	N/C	7.1	A:38,B:33,C:29	N/C	620
13	Jun 19, 2019 15:14	81	94.2	0	N/C	-9.0	C:100	N/C	275

View results Details... Print trend graphs and results table...
 Print results... Trends... Open trend graphs and results table in browser
 Comment... Import database... Test statistics...
 Delete selected record...
 Delete test data from the device memory... Close Help

The **“View results”** button generates a final report based on the results of assessments of the body state indicators and opens it in an HTML browser. An example is provided [here](#).

The **“Details”** button opens the [“Evaluation of indexes”](#) dialog box, where you can view detailed information about each of the indexes.

The **“Print results”** button allows printing the results of the selected test. Read about possible printing issues [here](#).

The **“Trends”** button opens the [“Trend graphs”](#) dialog box. In this dialog box, you can clearly see how the scores of indexes change from test to test.

The **“Comment”** button allows editing the comment to the test. Comments are displayed in the window to the right of the “Oxygen saturation” field (to see the comments, the window can be scrolled horizontally with the scroll bar at the bottom of the window or simply stretched). Comments to the test are also displayed in the final report.

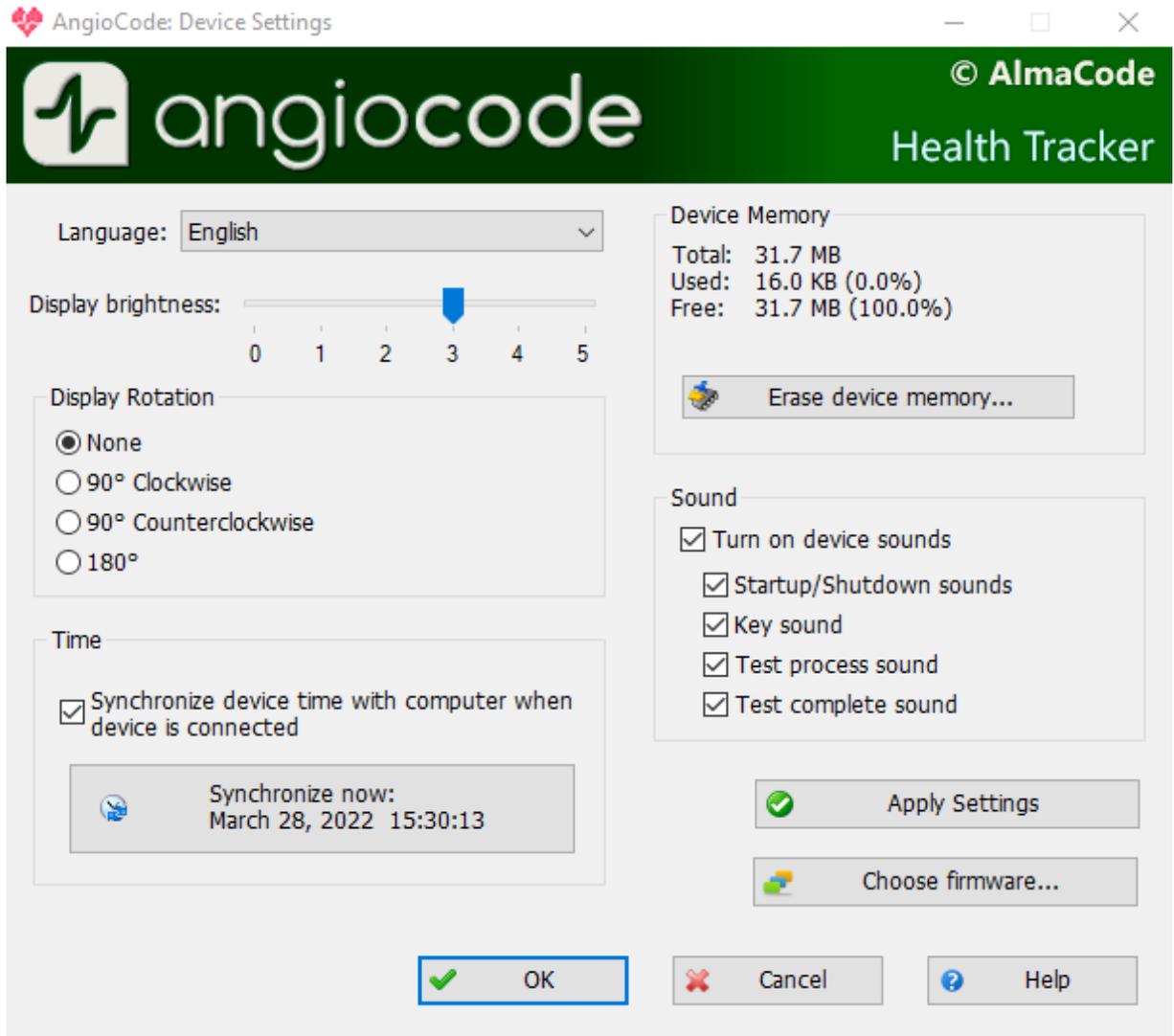
The **“Print trend graphs and results table”** link allows printing graphs of trends in indexes and a table of test results on a printer connected to a computer.

The **“Test statistics”** button opens the [dialog box of the same name](#) with statistics of tests conducted for certain periods of time.

The **“Delete selected record”** link deletes the record selected in the list from the database. Using the Shift, Ctrl and left mouse buttons, you can select several entries in the list and delete them all at once.

9.7 “Device settings” dialog box

In this dialog box, you can change the **AngioCode-301** program settings.



In the “**Interface language**” list you can select the language of the device interface

On the “**Display brightness**” scale, you can set the brightness of the device screen.

The “**Display Rotation**” setting allows selecting the orientation of the image on the device screen.

The “**Synchronize device time with computer when device is connected**” option enables automatic synchronization of the device's built-in clock with the computer's clock.

In addition, synchronization is possible at any time by pressing the “**Set now**” button

In the “**Device memory**” section, information is available on the state of the device's non-volatile memory, which stores test results.

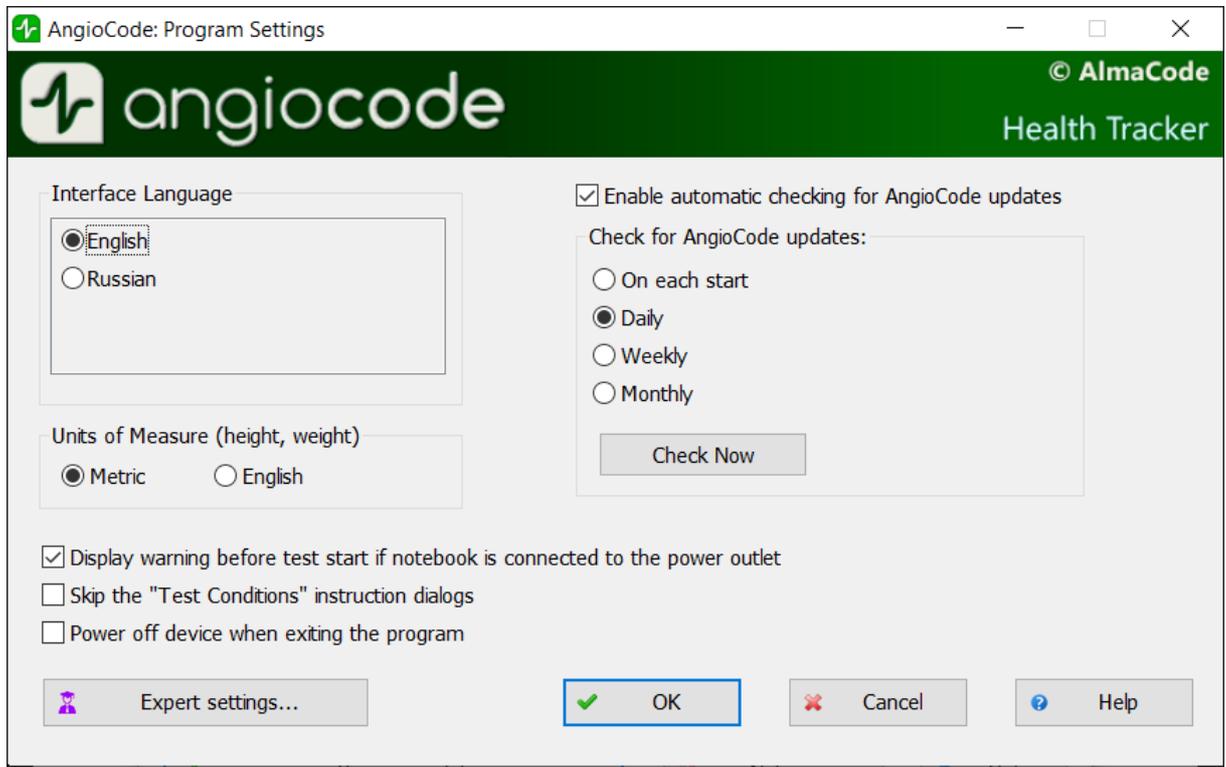
When pressing the “**Erase device memory**” button, it will be completely cleared.

In the “**Sound**” section, options are available to enable/disable the sound indication of the device.

By pressing the “**Apply settings**” button, the selected settings will be entered into the non-volatile memory of the device

9.8 “Program settings” dialog box

In this dialog box, you can configure the behavior of the AngioCode program:



In the “**Interface language**” list, you can select the language of the program interface.

The “**Enable automatic checking for AngioCode updates**” option enables automatic checking for software updates. It is recommended to use the latest version of the software, since not only the software for the computer is updated and improved, but also the software in the device.

The “**Display warning before test start if notebook is connected to the power outlet**” option: laptop power supplies usually create strong interference with the device's photosensor. The AngioCode program recognizes the work on a laptop connected to the power supply. If this option is set, then before the start of the test, a warning will be issued with a recommendation to disconnect the laptop from the network for the duration of the test. See also [Using AngioCode with a laptop](#).

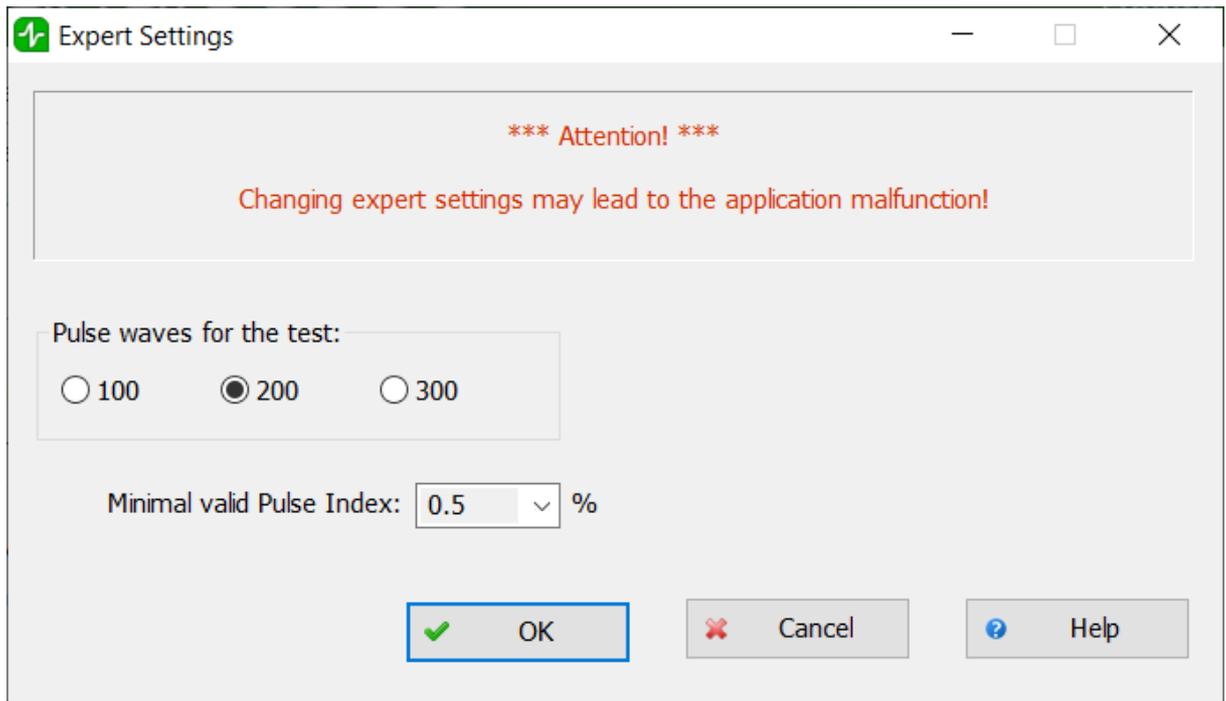
The “**Units of measure**” settings specify which units will be used for users' height and weight: centimeters and kilograms, or inches and feet.

The “**Skip the “Test conditions” instruction dialogs**” option: do not display dialog boxes for instructions on test conditions and recommendations.

The “[Expert settings](#)” button gives access to the management of test parameters other than the standard ones. It is recommended to leave these settings as default.

9.9 “Expert settings” dialog box

This dialog box gives access to the management of test parameters other than the standard ones. These settings are recommended to be left unchanged.



The **“Pulse waves for the test”** parameter determines the number of pulse waves that will be collected to generate performance indicators. The default value is 200. It is about 3 minutes. Better results are available at the setting - 300 (5 minutes). Express evaluation is possible at - 100 (1.5 minutes). When choosing the number of waves equal to 100, the error in estimating the level of stress increases.

The **“Minimal valid pulse index”** parameter determines the minimum signal quality received by the program. Under normal circumstances, values less than 0.5 should not be selected.

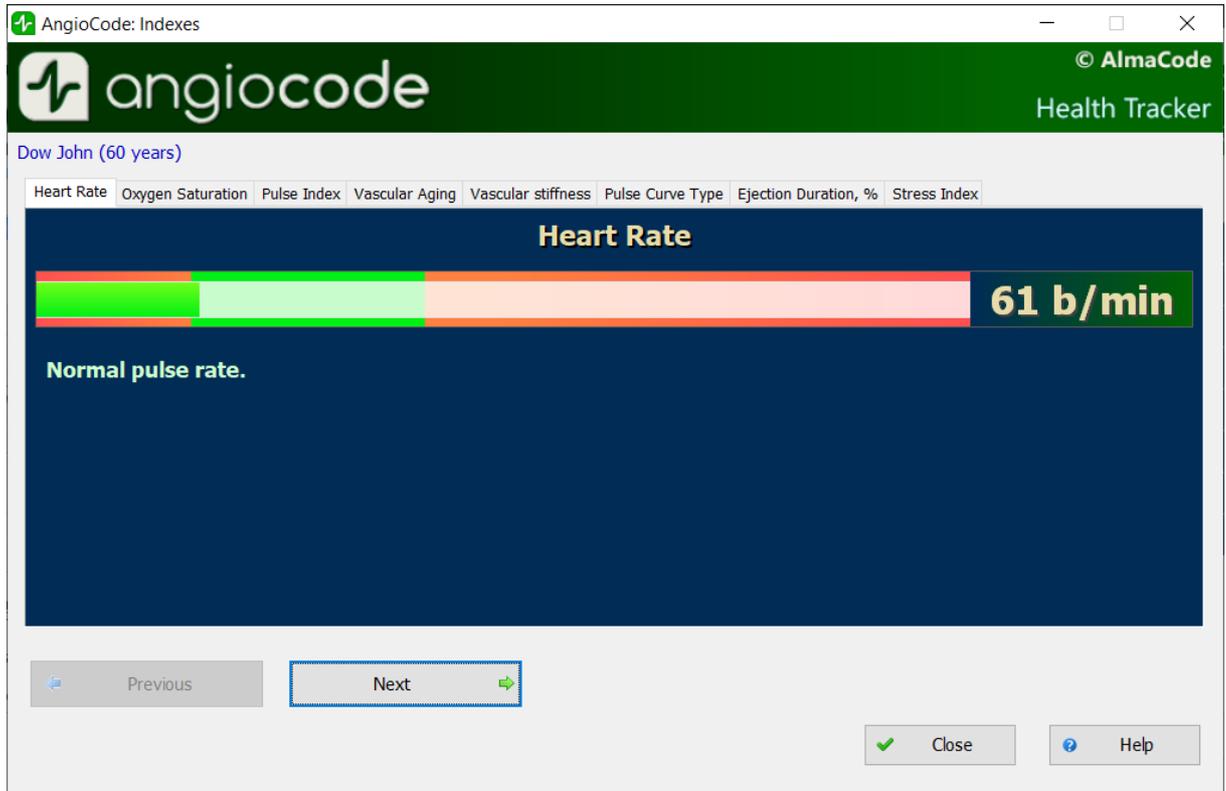
9.10 “Indexes assessments” dialog box

In this dialog box, you can view a description of each of the indexes. The dialog box has several tabs according to the number of indexes to be evaluated. You can scroll through the tabs one by one using the “Next” and “Previous” buttons, as well as by clicking on the title of the desired tab.

When displaying the results for each indicator, the program gives its assessment graphically, in the form of a color scale with an index, and numerically. Depending on the color marked with the pointer, the following evaluation options are distinguished:

- **green** - good condition
- **yellow** - satisfactory condition
- **red** - unsatisfactory condition, if there are consistently negative results for some time, it is recommended to consult a specialist.

9.10.1 “Heart rate” tab



Heart rate or the number of heartbeats per minute. The inverse of this value is the pulse wave duration. The device evaluates the duration of each pulse wave, calculates the instantaneous value of the pulse frequency, and determines the average value based on the test results.

This is an important indicator, primarily reflecting the fitness of the body. The higher the resting heart rate, the less trained the body and the cardiovascular system in particular. Regularly exercising people have a resting heart rate of 55-60, which can be evaluated as an excellent condition, 60-80 - good, over 90 - bad.

A more qualitative assessment of the body's fitness can be obtained by conducting stress tests.

As an option:

1. Determine the pulse rate in a normal resting state.
2. Do 20 squats in 30 seconds.
3. After 3 minutes, reassess heart rate and calculate the difference between the second and first results.

Result:

- good fitness - up to 5 beats;
- satisfactory - 5-10 beats;
- low - more than 10 beats.

9.10.2 “Oxygen saturation” tab

Oxygen, inhaled with atmospheric air, is transferred to the organs with the help of a special carrier protein - hemoglobin, which is contained in red blood cells, erythrocytes. The oxygen level in the blood or

the oxygen saturation degree of the blood shows how much hemoglobin in the body is in a state associated with oxygen.

Saturation - saturation (SpO₂) of blood hemoglobin with oxygen is a vital indicator, the value of which is determined by:

- pumping function of the heart
- ability of the lungs to oxygenate the blood
- state of hemoglobin, oxygen carrier.

Normally, almost all hemoglobin is associated with oxygen, while the hemoglobin saturation with oxygen varies in the range from 96% to 99%. A steady decrease in the level of saturation below 95% can be observed in diseases of the respiratory and cardiovascular systems, as well as in severe anemia, with a decrease in hemoglobin levels.

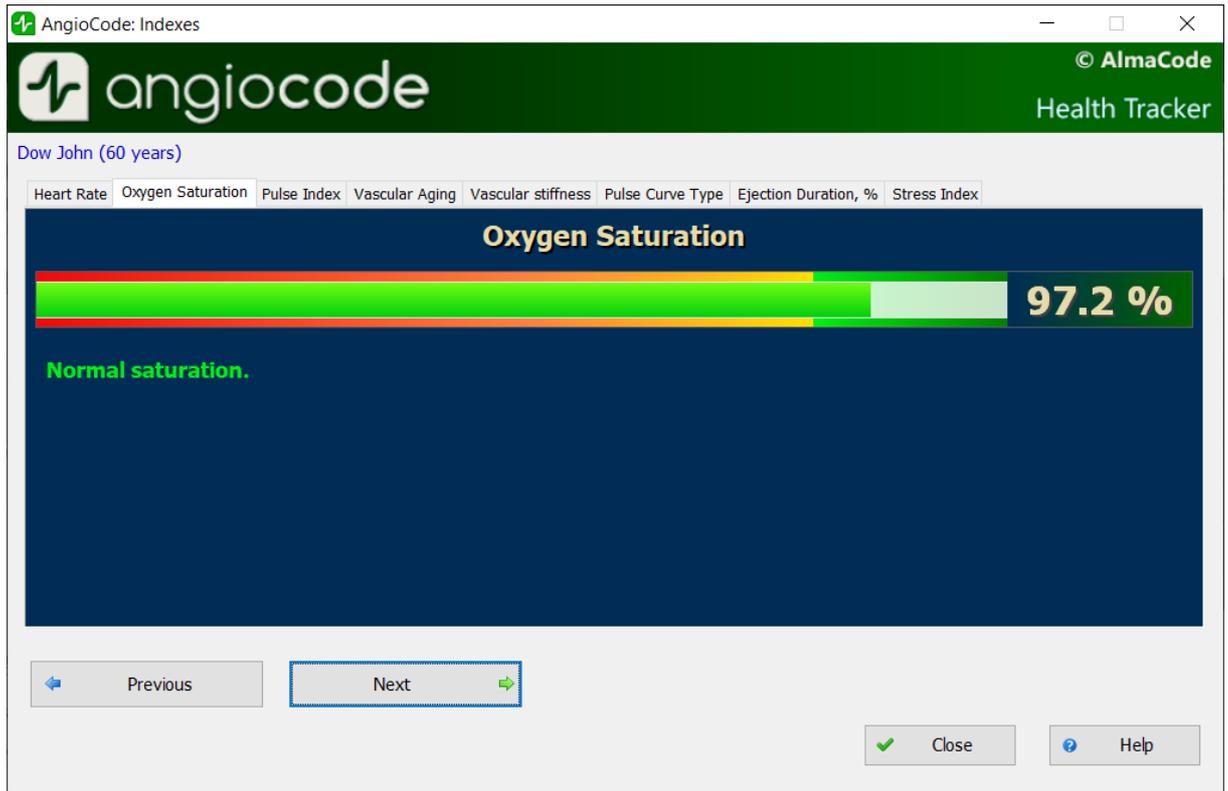
With chronic diseases of the heart and lungs, a decrease in this indicator may indicate an exacerbation of the disease, in such situation, one should seek medical help. A decrease in the level of saturation of hemoglobin with oxygen against the background of a cold, flu, acute respiratory viral infections, pneumonia and other lung diseases may indicate a complicated course of the disease.

The saturation level indicator is important for people with chronic lung diseases, including chronic bronchitis.

When performing a study, it should be taken into account that a number of factors can lead to an error in assessing the level of oxygen in the blood. Such factors include the presence of a manicure, especially with the use of dark shades of varnish, the movement of hands or trembling of the fingers during the examination, the presence of a strong external light source - solar or artificial, and the close proximity of sources of strong electromagnetic radiation, such as mobile phones. The low temperature in the study room can also lead to errors in the SpO₂ assessment.

There may be slight individual fluctuations in the saturation level. To correctly interpret the score for this indicator, several tests should be performed. This will reveal the individual characteristics of fluctuations in the level of oxygen in the blood, and will help to correctly interpret certain changes in the future.

A sharp decrease in SpO₂ by 3-4% of normal values can be a sign of the development of diseases such as influenza or pneumonia.



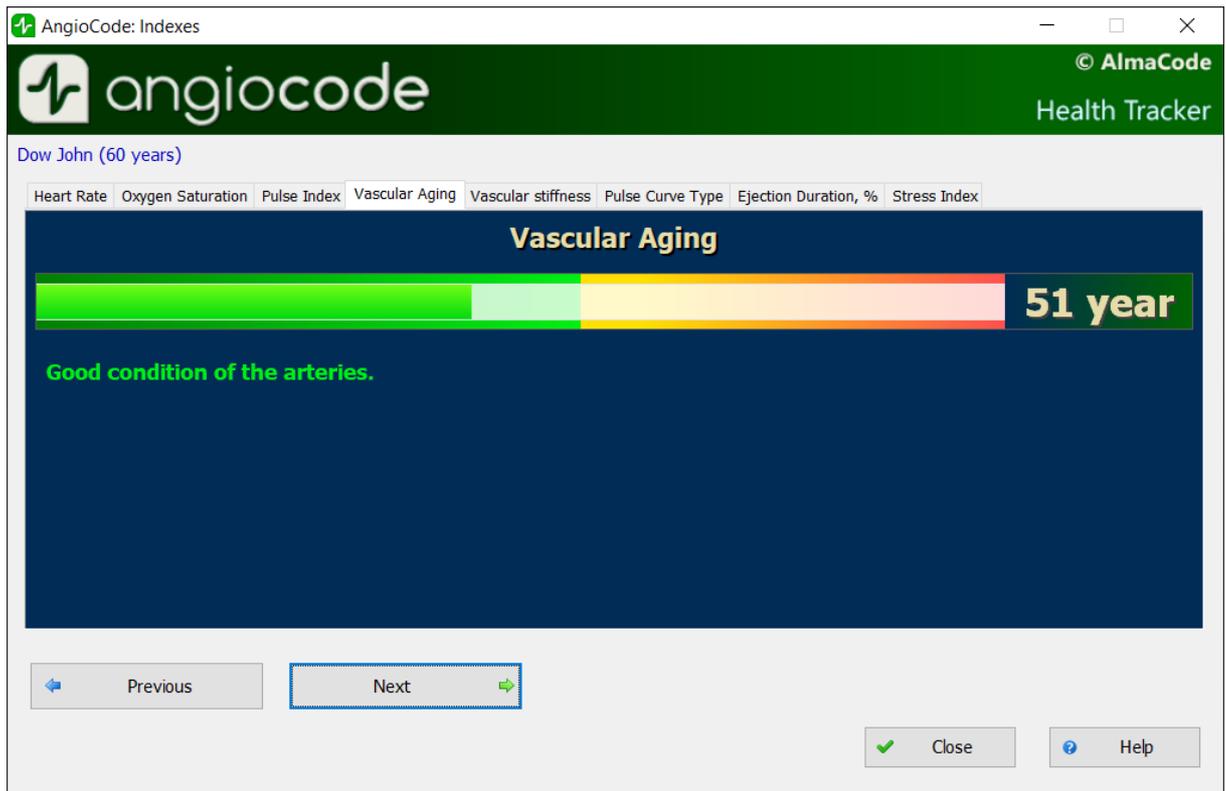
9.10.3 “Age of the vascular system” tab

If your vascular age is less than the passport age, then this is good. A constant significant excess of the vascular age over the passport age may be a recommendation for consultation with a specialist. At the same time, you can note a decrease in vascular age against the background of an increase in blood pressure and pulse rate.

It is important to fix this indicator at a certain time of the day and on the same hand, better on the working one.

Right for right-handed, left for left-handed persons.

A good time is the morning hours from 9 to 11 a.m.

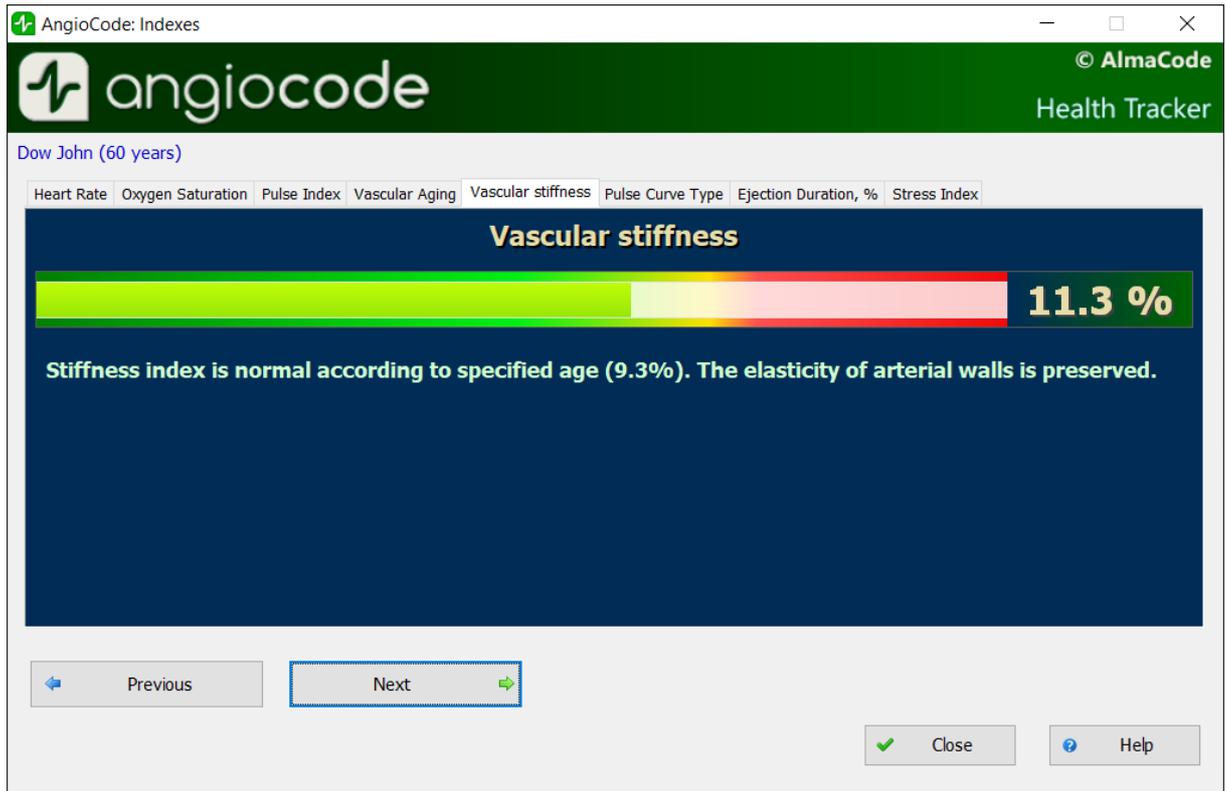


9.10.4 “Vascular stiffness” tab

Here the sign in front of the number is important. If it is negative, then this rather indicates the preserved elasticity of the arteries. The greater the negative value of the stiffness percentage, the better the condition of the large arteries.

The normal values of this indicator depend on the age of the subject: in the age category from 18 to 35 years, a negative value from -40% to -5% is considered the norm. In the age category over 40 years, the norm ranges from -5% to 5%. For people older than 55 years, positive values of this indicator are typical. Of course, the aging process is irreversible and inevitably leads to a gradual increase in vascular stiffness, but regardless of your age, you should strive to reduce the vascular stiffness index through a healthy lifestyle.

For a correct assessment of this indicator, it is necessary to first set the real age of the user in the device.

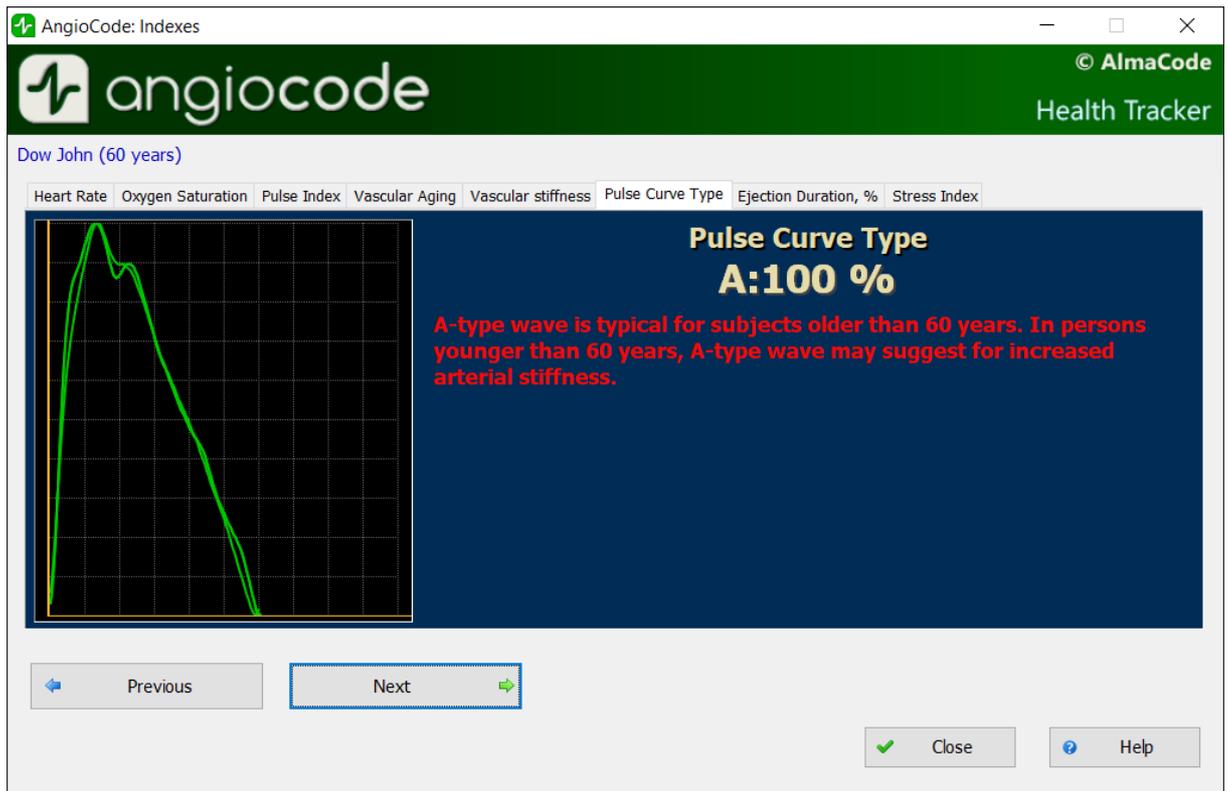


9.10.5 “Pulse curve type” tab

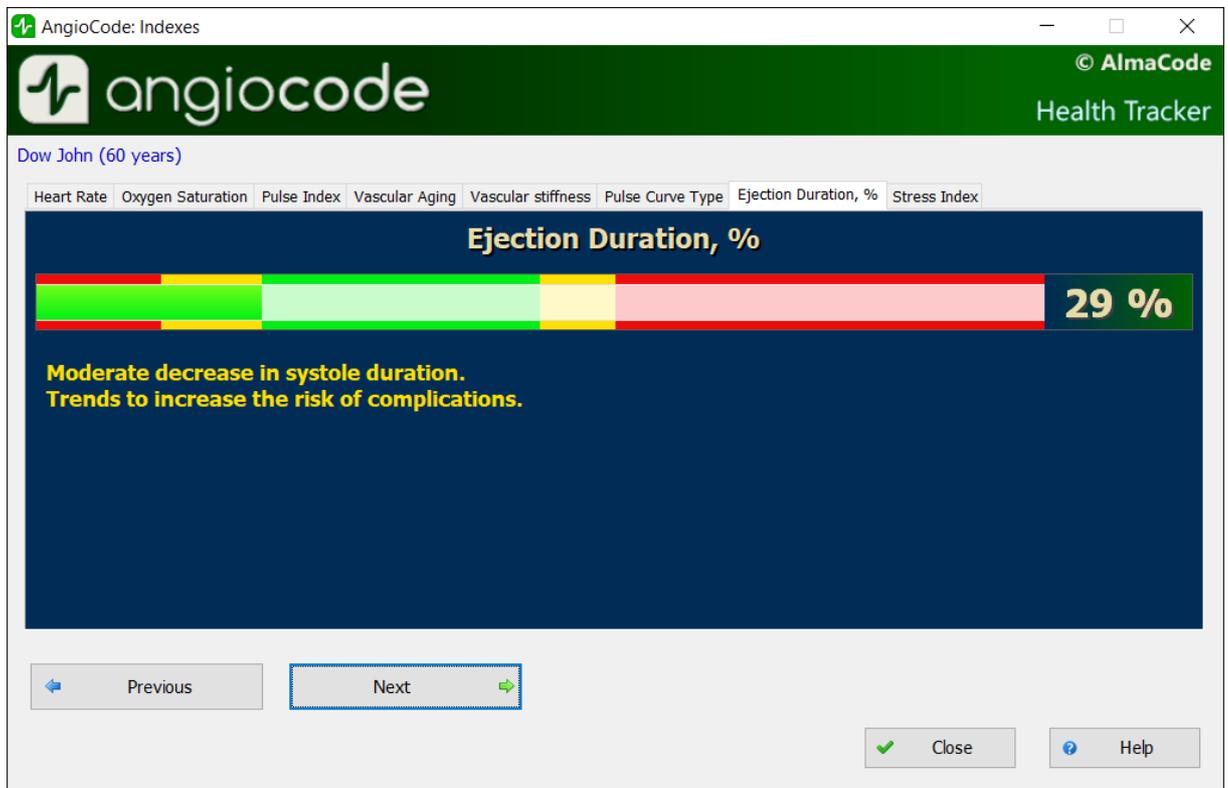
Pulse waves are divided into three types according to their shape.

Type C indicates good condition of the arterial wall, type B - satisfactory condition and type A - unsatisfactory condition. It is not uncommon to see more than one type of curves in a test. In this case, the higher the percentage of C-type curves, the better.

- Wave type C is observed in persons younger than 30 years, who most likely do not have risk factors of cardiovascular disease related to atherosclerosis.
- Wave type B curve is observed in persons over 40 years, or in younger ones, but possibly having risk factors of cardiovascular disease.
- Wave type A is observed in the elderly people over 55 years, but can also be encountered in younger people, with the likelihood of impairment or temporarily, with overworked conditions. In young people, wave A is often found in chronic sleep deprivation.



9.10.6 “Systole duration” tab



The ratio of systole duration to total cardiac cycle duration (ED%) reflects the characteristics of the myocardial work cycle.

Systole is the time of tension and work of the heart muscle, diastole is the time of relaxation, recovery, blood supply. The approximate ratio of systole to pulse wave length in the normal range is 1/3 or 33%. When the heart rate increases, the duration of the cardiac cycle shortens mainly due to diastole. Sometimes the systole duration increases up to 50% or more, entering the zone of myocardial instability. To assess this index, methods have been adopted to convert the systole duration to the value expected at a pulse rate of 60 beats per minute.

The ED% values are characterized by the following qualitative intervals:

- less than 25%: pronounced decrease of systole duration. Increased risk of complications;
- 25% - 29%: moderate decrease in systole duration. Tendency toward an increased risk of complications;
- 29% - 40%: normal systole duration;
- 40% - 43%: moderate excess of systole duration over normal. Decreased heartbeat stability, risk of arrhythmia.
- more than 43%: pronounced excess of systole duration over normal. Significant decrease in the heartbeat stability, increased risk of arrhythmia.

The boundaries of the assessment of this indicator for women can be shifted by +1%, for men by -1%. Or rely on the averages given.

Exceeding the systole duration is associated with a decrease in the heartbeat stability and increases the risk of arrhythmia. Sustained reduction in systole duration may accompany increased risks of cardiovascular complications.

Causes of systole duration exceeding the norm may be:

- Myocardial infarction;
- Reduced myocardial contractility;
- Enlargement of the left ventricular myocardium;
- Congenital peculiarities of the body;
- Certain medications taken;
- Alcohol abuse;
- Lack of potassium, magnesium;
- Low-protein diet.

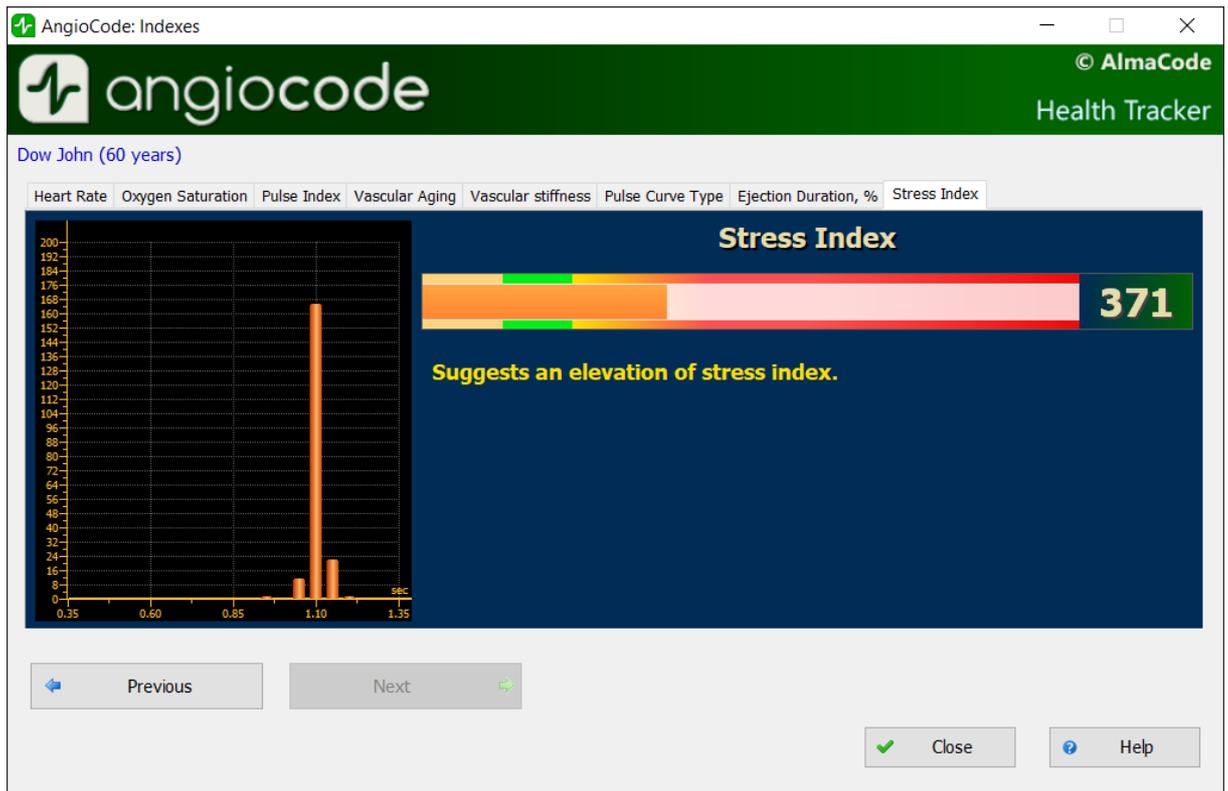
9.10.7 “Stress index” tab

The indicator reflects the state of the centers that regulate the mode of operation of the body and the cardiovascular system in particular. Values less than 150 indicate a good, balanced state of regulation. Exceeding this threshold value indicates an excessive tension of regulatory mechanisms, and an index value of 900 or more indicates pronounced dysregulation.

The indicator is calculated based on the analysis of the distribution of the duration of pulse waves.

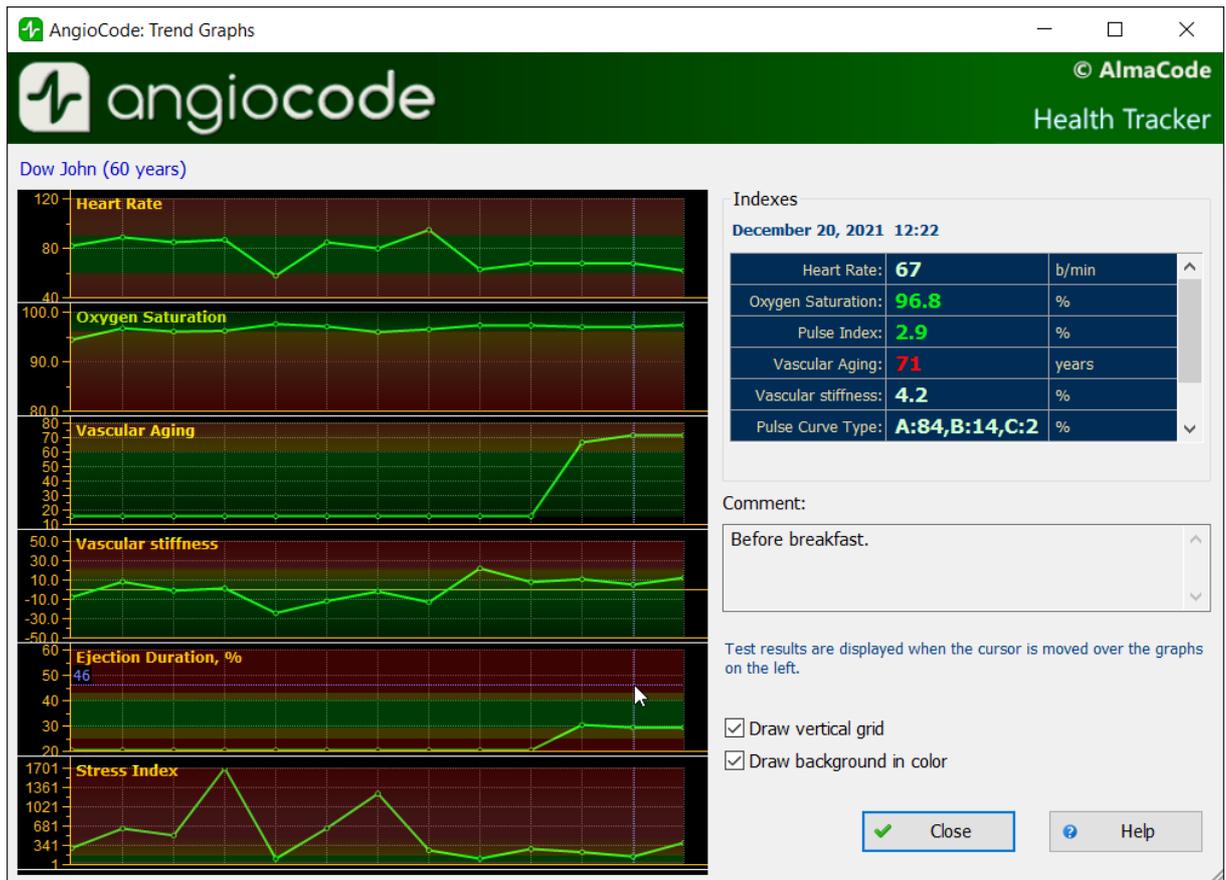
- 50 ... 150 - norm
- 150 ... 500 - stress, physical activity, fatigue, decrease in reserves with age
- 500 ... 900 - angina pectoris, psychophysiological fatigue, significant stress
- 900 . 1500 - significant violation of regulatory mechanisms

Comment: With arrhythmias, serious violations of the respiratory function, this indicator is not applicable. The result obtained in this case gives a falsely low indicator of stress.



9.11 “Trend graphs” dialog box

In this dialog box, you can see how the assessments of indexes change from test to test. Note that this dialog box can be resized just like any Windows window.



In the left part of the dialog box there are graphs of changes in indexes. The number of points on each graph corresponds to the number of tests performed.

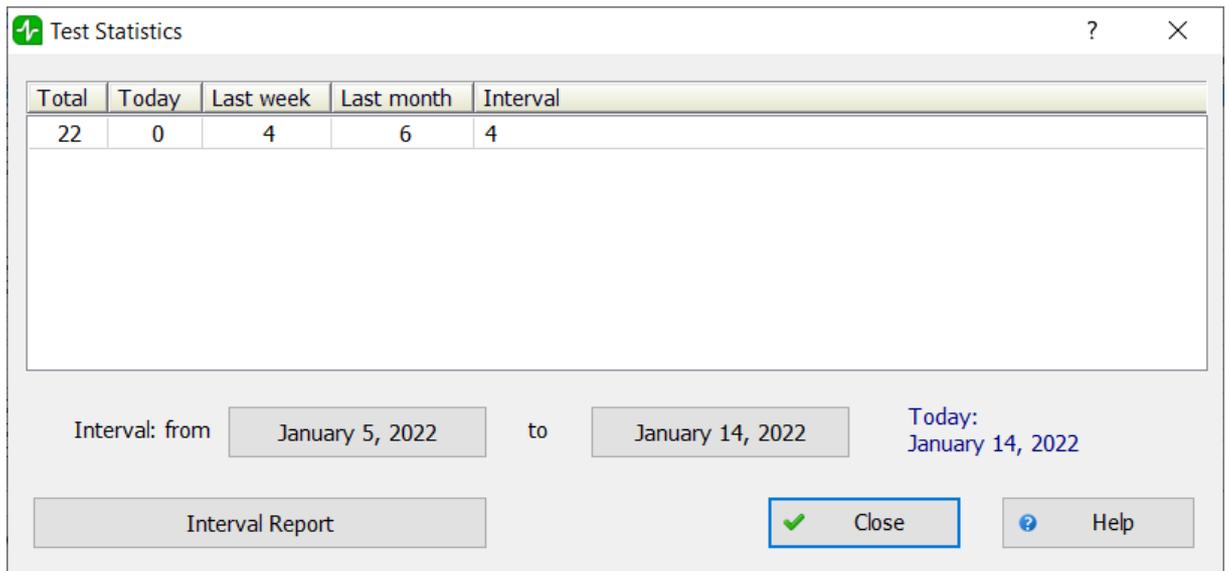
When moving the mouse cursor over the graphs, the results of the corresponding test and, if available, a comment to it, are displayed on the right. The date and time of the test is displayed at the top of the list of results.

Disabling the “**Draw vertical grid**” option removes the vertical grid on the graphs, which can be useful for a large number of tests. Each vertical line corresponds to one test, regardless of the date of the test.

Disabling the “**Draw background in color**” removes the background color indication, which indicates “good” and “bad” areas of indicator values.

9.12 “Statistics of performed tests” dialog box

In this dialog box, you can see the statistics of tests conducted for certain periods of time. Statistics are calculated for all users who are registered in the database.



Using the buttons with dates, you can set the start and end dates of the time interval for which the statistics are calculated, displayed in the column under the heading “For the specified interval”.

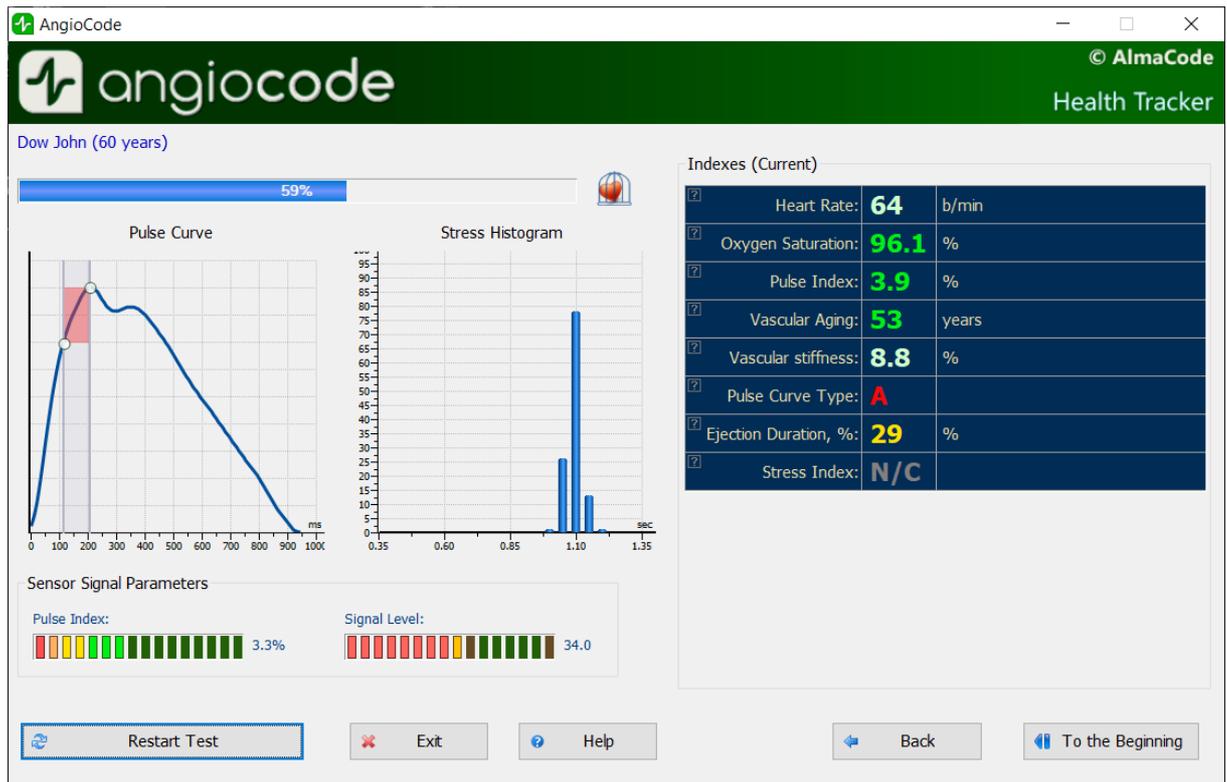
9.13 Dialog boxes with instructions for the test procedure

Before performing the test, you are prompted to familiarize yourself with the procedure for preparing the user for the test and the conditions for conducting the test. The instructions are presented in the form of a series of dialog boxes, accompanied by photographs with explanatory text. All dialog boxes have a “**Skip Instructions**” button, which allows going directly to the [test dialog box](#).

You can also permanently disable instructions using the corresponding option in the [program settings dialog box](#).

9.14 “Test start” dialog box

This dialog box is designed to test the state of the body and, in particular, the cardiovascular system.



In the upper left part of the window, under the user's first and last name, there is the **test status indicator**. During the test, it displays the degree of completion in percent. The duration of the test depends on several factors - the user's heart rate, the position of the sensor on the finger, the perfusion index (see below), etc. The test is terminated when the device collects enough pulse waves of acceptable quality for analysis. Upon successful completion of the test, the result is stored in the database automatically.

Under the test status indicator, there is a **sensor signal graph**, where the signal coming from the sensor of the device is visible in real time, and a **stress index diagram**.

Below are two diagrams that indicate the quality of the signal received from the sensor. The **perfusion index** should not be less than 1, and the **signal level** should be within 3...120. If these conditions are not met, then the test results will be unreliable, about which a warning message will be issued.

Reasons for poor signal quality can be:

- Low finger temperature, which is especially common among female users. It is necessary to warm up the hands, it is not recommended to use hot water for this.
- Opaque nail polish. In this case, it is allowed to turn the device on the finger by 90 degrees, so that the nail was on the side.

The **"Restart test"** button restarts the test procedure. If a restart occurs before the current test has been completed, then the test results are not stored in the database.

In the right part of the dialog box there is a **list of assessed indexes**. During the test, the values of the indexes correspond to the last recognized pulse wave. At the end of the test, the average values of the indexes are displayed.

At the end of the test, the buttons below the list of indicator values become available:

The **“View result”** button generates a final report based on the results of assessments of the body state indexes and opens it in an HTML browser. An example is provided [here](#).

If the **“Automatically open the final report”** option is enabled, then it is generated and opened automatically at the end of the test.

The **“Detail”** button opens the [“Indicator assessments”](#) dialog box, where you can view a description of each assessment.

The **“Print result”** button allows printing the final report on a printer connected to your computer. Read about possible printing issues [here](#).

The **“Comment”** button allows entering a comment on the test. Comments are displayed in the test results dialog box to the right of the “Oxygen saturation” field, and are also displayed in the final report.

The **To the beginning**” button closes this dialog box and opens the [AngioCode](#)home dialog box.

Chapter



X

10 Applications

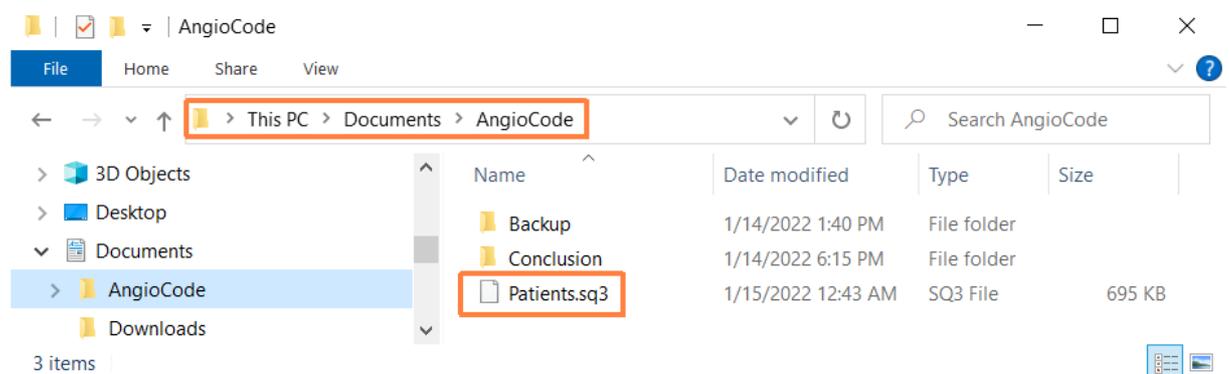
10.1 AngioCode database information

The database file AngioCode has a name **Patients.sq3**. The package comes with a database, which already contains several virtual users for demonstration purposes. At the first start of the AngioCode program, this database file is copied to the folder:

Under Windows 7, 8, 10:

C:\Users\\Documents\AngioCode

In Windows Explorer, this folder is visible as a subfolder in “Documents”:



The database file is not removed when the AngioCode package is uninstalled and is not updated when new versions are installed. So all AngioCode versions use the same database and do not require any configuration when installing new versions.

Please note that the database is different for each Windows user of the same computer.

To transfer the AngioCode database to another computer, just copy the file **Patients.sq3** to the appropriate folder on another computer.

10.2 Final report example

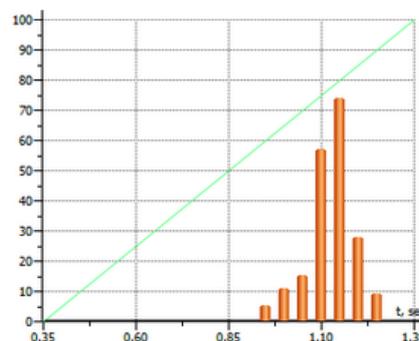
Dow John

Sex: Male, Age: 60, Height: 184 cm, Weight: 90 kg, Registered: January 14, 2022 14:58, e-mail: qwaunz@gmail.com

Pulse Wave Graphs



Stress Index Diagram



Results

Index	Norm	Measured Value	Description
Heart Rate	60...90 bpm	58 b/min	Pulse rate is less than normal values (bradycardia).
Oxygen Saturation	96%...99%	96.7 %	Normal saturation.
Pulse Index	PI > 1.5%	1.7 %	Sufficient PI level. The data is suitable for processing.
Vascular Aging	53...60	42 years	Good condition of the arteries.
Vascular stiffness	-0.7%...19.3%	-2.0 %	Stiffness index is less than normal values corresponding to a good condition of arteries' walls (9.3%).
Pulse Curve Type	B	A:73,B:23,C:4 %	A-type wave is typical for subjects older than 60 years. In persons younger than 60 years, A-type wave may suggest for increased arterial stiffness. B-type wave is typical for subjects older than 40 years. C-type wave is typical for younger subjects in the age of 18-35 years with normal elasticity of arterial walls.
Ejection Duration, %	29% <= %ED < 40%	28 %	Moderate decrease in systole duration. Trends to increase the risk of complications.
Stress Index	50...150	62	Normal value. Optimal work of cardiovascular regulatory centers.

Attention!

The AngioCode is not a medical device! This is a device for monitoring physiological parameters at home. Any data obtained using the device is only of informational value and cannot be used for diagnosis, treatment, or therapy.

AngioCode: January 14, 2022 18:15 <http://www.angiocode.ru>
AngioCode assessment provides educational information reflecting the individual's current state of fitness and wellness.
The AngioCode assessment does not replace the advice of a licensed physician.

10.3 Possible printing issues

Different printers have their own settings, and certain combinations of these settings may cause printing from the AngioCode program to fail. If this happens, then try changing the value of the option "Output TrueType as graphics" in the properties of the printer that is used for printing. This option may also be called "Send TrueType as Bitmap".

You can completely avoid printing problems by installing a virtual printer, for example, [doPDF](#). Printing to this kind of virtual printer creates a PDF file that you can either print or use to share test results in a visual form.

screen orientation 20
screen rotation 20
screen setup 20
settings 15
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sound control 16
sound indication 12
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sound on 16
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