IvorMedical

cpro®

Instructions for Use

iOS (Apple)

Slavka Krautzeka 83a, 51 000 Rijeka, Croatia • tel: + 385 91 1234598 • email: info@ivormedical.com

CPR PRO

Category: Medical
Version: 2.0
Language: English

Requirements: Compatible with iPhone, iPod touch, and iPad. Requires iPhone OS 2.2.1 or later.

CPR PRO mobile application offers educational videos and help in real emergencies with CPR coaching and feedback. It helps rescuers deliver CPR according to guidelines, and offer the best chances of survival and good recovery to the victim.

Sudden Cardiac Arrest

Heart disease is a leading cause of death worldwide. Half of all heart disease deaths can be attributed to SCA, a situation in which the heart abruptly stops working, so no blood can be pumped to the rest of the body. If SCA is not treated immediately, it causes sudden cardiac death (SCD). However, survival of SCA is possible if the victim receives help. Unfortunately, research shows that only about 1 in every 3 SCA victims receives bystander CPR.

Cardiopulmonary Resuscitation

CPR can be life-saving if it is started quickly after a person collapses. It can prevent damage to vital organs and double a victim's chance of survival. CPR consists of two main actions, chest compression (to make the blood flow) and rescue breaths (to deliver oxygen to the lungs). Watch Basic Life Support and Recovery Position videos in the video section of the app to learn more.

External chest compressions in CPR

External chest compressions are a standard procedure which is performed during CPR in individuals who have experienced cardiac arrest.. This procedure is performed while the patient lies on a hard surface, so that the rescuer rhythmically pushes down on the patient's sternum. In the traditional sense, as this skills has been taught and performed for decades, the rescuer performs chest compressions with his own hands. He places the palm of his dominant hand in the middle of the patient's chest, and the other palm on top of the first. Rescuer's arms must remain straight in the elbows and his shoulders placed in the position over the patient's mid-chest. Compressions of the thorax are then executed in a way that the rescuer transfers his weight to the patient's chest. For the described cardiac massage to be successful, it is necessary to perform it according to international guidelines. Current guidelines require that the compressions should be performed at the rate of 100 per minute and that the sternum in adult patients should be impressed 4-5 cm in depth. It has been proven that correctly performed CPR, in accordance with internationally recognized guidelines, can double the chances of survival of patients in cardiac arrest. However, when performing external chest compressions in a traditional way, without additional tools, numerous problems reduce its effectiveness. In the real situation the rescuer cannot be sure whether he is performing chest compressions in accordance to the above mentioned guidelines. Research and experience has shown that CPR knowledge and skills quickly fade away after training.

CPR PRO version 2.0 features include:

- Compliance with the latest 2010 international CPR science guidelines
- Educational videos demonstrating CPR and other first aid skills
- Visual and audio prompts
- Instant access to CPR coaching
- Visual and audio prompts
- Metronome to pace chest compressions
- Rate detection of actual compressions
- Detection of number of compressions
- Prompts to give two rescue breaths over 1 second, after the detection of 30 chest compressions
- Prompts to pace ventilation, when the airway is secured (10 per minute)
- Stopwatch running continuously, helping you keep track of time (regularly reassess the victim, deliver defibrillation and drugs, change rescuer roles, etc.)
- Two modes of operation, 30:2 and PRO – to be used when the airway is secured or if unwilling/unable to provide mouth-to-mouth ventilations
- Recording of compression data
- Review of compression data on the phone
- Synchronization of compression data to a computer via iTunes or email
- Elegant and soothing design
- Designed to work with CPR PRO cradle for iPhone, soon to be available from Ivor Medical
- Basic Life Support algorithm with photographs
- Complete Instructions for Use

Using CPR PRO

CPR PRO helps a trained individual to deliver CPR according to guidelines, and offer the best chances of survival and good recovery to the victim by providing quick access to CPR prompts and feedback.

Before use

Before using the app, be sure that you, or somebody else has called for an ambulance. After you have made a call to your local Emergency Medical Service (EMS), and if you are using an iPhone, be sure to put it into airplane mode if you want to block incoming calls, which would interrupt the app during use. You can do this by tapping Settings and turning airplane mode on. When airplane mode is on, its icon appears in the status bar at the top of the screen, and no cell phone, radio, Wi-Fi, or Bluetooth signals are emitted from iPhone.

NOTE: When your iPhone is in airplane mode, EMS will not be able to call you back.

Holding your device

CPR PRO app works in landscape mode. It will start oriented with the home button of your device to the left. Rotating the device 180 degrees will also change the orientation of the app.

CPR PRO uses the built in accelerometer in your device to provide CPR feedback. Your device needs to follow your movements during chest compressions to prove CPR feedback.

There are several ways you can hold your device to receive CPR feedback:

- The device can be **placed between hands**. It can be held with the right or the left hand. Grasp the device by the end with home button. If you grasp it on the opposite end you can accidentally touch the volume button.

  NOTE: On older iPhones, mainly 2G, 3G and 3GS, due to hardware layout, accelerometer might show different reading depending who you hold the phone. Test different positions, to find which works best on you phone.

- Using a **strap or armband**, you can attach the device to the back of your hand, or in different positions on your arm.

- Use **CPR PRO cradle** made by Ivor Medical. Place the device inside the cradle. Place the cradle on the victim's chest, and hold it by two ends to perform chest compressions. The cradle will allow clear view of the app, protect you device, assure best app performance, and make chest compressions easier and less physically demanding, so you can perform CPR for longer periods of time.

- If you would like to receive **only CPR prompts**, without CPR feedback, place the device somewhere near you so you can still hear its audio prompts. Enter PRO mode and follow audio prompts for rhythm of chest compressions and ventilations.

Starting the app

Start CPR PRO by tapping on its icon. CPR PRO works in two different modes - 30:2 and PRO. You can enter each of these modes by a single tap once the app starts.

30:2 mode

Enter 30:2 mode by tapping on 30:2 button. This mode provides prompts and feedback for one or more rescuers providing Basic Life Support (BLS), consisting of chest compressions and rescue breaths. Once you start 30:2 mode, a female voice will instruct you to *"Deliver 30 chest compressions"*. Following her command, you will hear a beeping sound playing at the rate of 100 minute. This is a **metronome** providing you with the appropriate rhythm for chest compressions. Synchronized with the sound, the screen will also flicker at the same rate, changing color from white to pink.

There are two fields in this mode. **The CPM (Compressions per minute) field** on the left gives you feedback on the actual rate of your chest compressions. If your compressions are at the rate of 90 to 110 per minute, the numbers will turn green, indicating that you are performing chest compressions at an appropriate rate.

The CNo (Compression number) field on the right counts the number of your compressions up to 30. When you have reached 30 compressions, the metronome sound will stop and a female voice will instruct you to *"Give two rescue breaths"*. She will then say *"Breathe"* during one second, twice in a row, to guide you through rescue breaths. Each

time the screen will also turn blue for a period of one second. This is made to help you deliver good rescue breaths. Following two rescue breathes, a female voice will instruct you to *"Continue chest compression"*, and the metronome sound will start again.

At the top of the screen, between two fields, there is a **stopwatch** running continuously from the moment you entered 30:2 mode. It helps you keep track of time (regularly reassess the victim, deliver defibrillation and drugs, change rescuer roles, etc.).

At any moment you can switch to PRO mode, by tapping on the PRO button at the bottom of the screen. The stopwatch will continue running without interruptions.

NOTE: For the CNo field to count chest compressions, your actual movement it will need to be within adequate limits regarding depth and speed.

PRO mode

You can enter PRO mode from the home screen or 30:2 mode, by tapping on its button. This mode provides prompts and feedback for rescuers performing Advance Life Support, or those who are unwilling or unable to provide rescue breaths, thus delivering only chest compressions.

Once you start PRO mode, the **metronome** will continuously play at the rate of 100 a minute synchronized with the screen flickering from white to pink. Every 5 seconds you will hear a high- pitched sound alerting you that it is time to ventilate the patient. One second later (every 6 seconds) you will hear a deeper sound over one second, which

coaches you to deliver **ventilations** at appropriate rate and during adequate time. This way you will deliver around 10 ventilations per minute to a patient with a secure airway (endotracheal tube). If you are using this mode to deliver chest compressions only, ignore sounds for ventilation.

There are two fields in the PRO mode.

The CPM (Compressions per minute) field gives you feedback on the actual rate of your chest compressions. If your compressions are at the rate of 100 to 120 per minute, the numbers will turn green, indicating that you are performing chest compressions at an appropriate rate.

The CNo (Compression number) field on the right continuously counts the number of your compressions.

NOTE: For the CNo field to count chest compressions, your actual movement will need to be within adequate limits regarding depth and speed.

At the top of the screen there is a stopwatch, which is continuously running. It helps you keep track of time (regularly reassess the victim, deliver defibrillation and drugs, change rescuer roles, etc.).

At any moment you can switch to 30:2 mode, by tapping on the 30:2 button at the bottom of the screen. The stopwatch will continue running without interruptions.

NOTE: If your phone or the app should malfunction during use, continue to administer CPR.

Exiting the app

To exit the app, push the home button on your device.

Compression Data

Every time you start CPR by entering either 30:2 or PRO mode, the app starts recording your data. Recording stops once you return to the main screen or exit the app. For each session a new csv (comma-separated values) file is created and named by default based on date and time. App records several variables: start and stop date and time, duration, hands

off time (time in seconds with no compressions delivered), compression number, rate of each compressions and mode for each compression. The app also automatically calculates duration of each session, you average rate and percentage of your compressions within guidelines for rate.

Accessing Compression Data

To access compression data tap on the Settings button, in the middle of the bottom bar on the main screen. Tapping on Compressions Data you will see a list of all record currently saved on the phone.

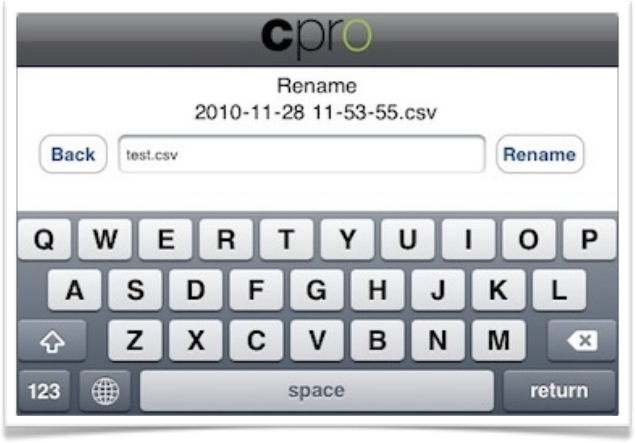
NOTE: if you see no records, try tapping the refresh button on the the right.

Tap on any of the records, to see more details. You can review the file on your phone and also rename it, by tapping on the Rename button.


cpro
2010-11-28 11-53-55.csv
2010-11-28 11-54-33.csv
Back
Refresh

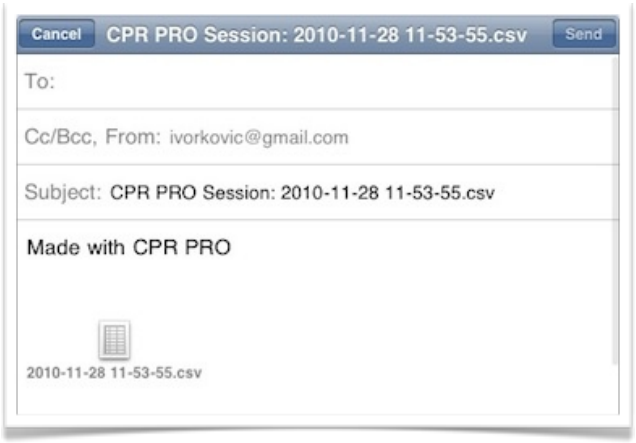

cpro
2010-11-28 11-53-55.csv
Delete
2010-11-28 11-54-33.csv
Back
Refresh

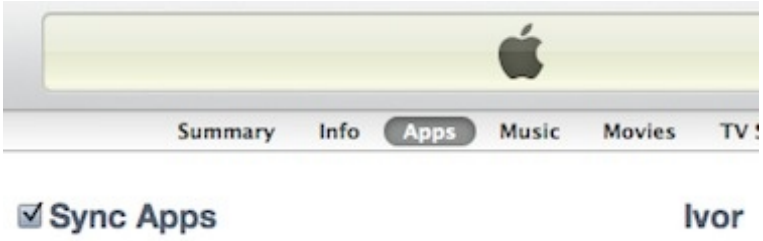

cpro
2010-11-28 11-53-55.csv
CPR PRO version 2.0
Ivor Medical
support@ivormedical.com
http://www.ivormedical.com
Started CPR
2010-11-28 11:54:12
Stopped CPR
2010-11-28 11:54:33
Duration
00:00:20
Back
Rename
Email

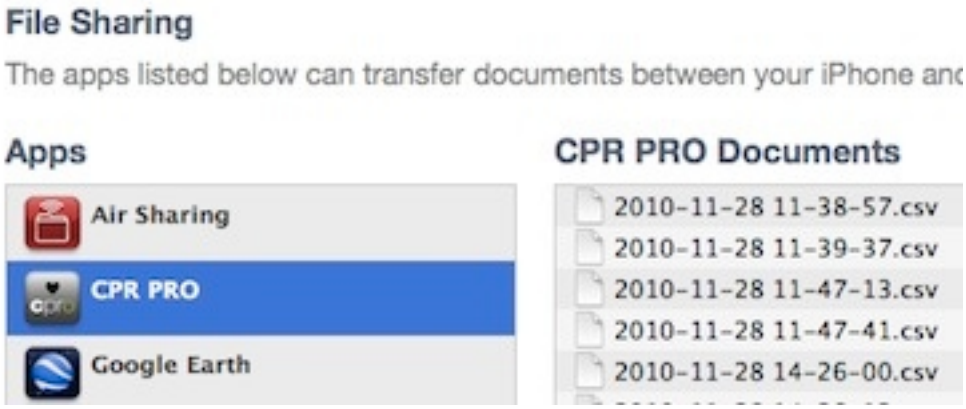

cpro
Rename
2010-11-28 11-53-55.csv
Back
test.csv
Rename
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
return

Managing Compression Data

There are two ways in which you can send your Compressions Records to your computer. Tap the E-mail button and fill in an e-mail address, and tap on Send to e-mail a csv file. You can also synchronize Compressions Data via iTunes. Just connect you iOS device to your computer, open iTunes, click on the device in the left bar and chose Apps top tab. Now select CPR PRO from the File Sharing applications list and use Add and Save To buttons to manage the files. There are two ways in which you can delete records from the app, in the iTunes or swiping your finger across the record on you iOS device and tapping on delete.







About Ivor Medical

Ivor Medical is a company from Croatia, with its office located inside the Science and Technology Park of the Rijeka University. It was started by the emergency physician Ivor Kovic to conduct research and development of modern medical devices for emergency medicine and first aid. The first product being developed by the company is an innovative aid and mobile application for cardiopulmonary resuscitation (CPR).