

## Ambulantna kardiovaskularna rehabilitacija u Hrvatskoj

### Outpatient Cardiovascular Rehabilitation in Croatia

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RECEIVED:  
 February 22, 2015

ACCEPTED:  
 February 25, 2015



**SAŽETAK:** Kardiovaskularna rehabilitacija timski je postupak koji se interdisciplinarnim i transdisciplinarnim pristupom zdravstvenih djelatnika u specijaliziranim bolničkim ili ambulantnim centrima provodi kao dio kardiološkog liječenja bolesnika. Istodobno provedeni kardiovaskularni trening pod nadzorom kardiologa uz telemetrijsko monitoriranje elektrokardiograma, cjelovita neinvazivna dijagnostička obrada, psihodijagnostika i savjetovanje psihologa, terapijska edukacija te nefarmakološke mjere uz uobičajeno medikamentno liječenje čine neodvojive sastavnice programa kardiovaskularne rehabilitacije. Članak donosi prikaz organizacije rada ambulantne kardiovaskularne rehabilitacije u Republici Hrvatskoj, koja je učinkovit, siguran, individualno prilagodljiv i ekonomski isplativ postupak koji smanjuje smrtnost, povećava funkcionalni kapacitet, vraća radnu sposobnost i poboljšava kvalitetu života.

**SUMMARY:** Cardiovascular rehabilitation is a part of cardiologic treatment that is performed in specialized hospital or outpatient centers by a team of medical personnel using an interdisciplinary and transdisciplinary approach. Cardiovascular training with telemetric electrocardiogram monitoring under the supervision of a cardiologist, full non-invasive diagnostic testing, psychodiagnostics and psychological counseling, patient education, and non-pharmacological measures coupled with typical medication treatment are all integral components of cardiovascular rehabilitation programs. This article describes the organization of outpatient cardiovascular rehabilitation in the Republic of Croatia, which is a effective, safe, cost-effective procedure that can be tailored to the patient and reduces mortality, increases functional capacity, restores work fitness and work capacity, and improves quality of life.

**KLJUČNE RIJEČI:** kardiovaskularna rehabilitacija, sekundarna prevencija, tjelesna aktivnost.

**KEYWORDS:** cardiovascular rehabilitation, secondary prevention, physical activity.

**CITATION:** *Cardiol Croat.* 2015;10(1-2):28-42. | DOI: <http://dx.doi.org/10.15836/ccar.2015.28>

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Dosadašnja su istraživanja dokazala su da odgovarajuća kontrola vrijednosti arterijskoga tlaka u bolesnika s arterijskom hipertenzijom, optimalna vrijednost lipida u onih s dislipidemijom i vrijednosti glikemije u pacijentata s dijabetesom i metaboličkim sindromom te prestanak pušenja, optimalna tjelesna aktivnost i kontrola psihosocijalnih čimbenika smanjuju poboljšanje i smrtnost od srčanožilnih bolesti, poglavito koronarne bolesti srca (KBS).<sup>1-3</sup> No, usprkos

Studies have shown that appropriate management of blood pressure in patients with arterial hypertension, optimal lipid values in patients with dyslipidemia, and glucose values in patients with diabetes and metabolic syndrome, as well as smoking cessation, optimal physical activity, and management of psychosocial factors reduce comorbidity and mortality from cardiovascular diseases, coronary heart disease (CHD) in particular.<sup>1-3</sup> How-

boljem liječenju KBS-a organiziranjem mreža primarne percutane intervencije za zbrinjavanje akutnog infarkta miokarda (AIM) i dosljedne primjene dokazanih mjera sekundarne prevencije, znatan broj osoba i dalje umire od te bolesti. Podatci Hrvatskog zavoda za javno zdravstvo o broju umrlih iz 2013. godine upućuju na to da je AIM jedan od najčešćih pojedinačnih uzroka smrti u nas, od kojeg je umrlo 3456 osoba (2063 muškaraca i 1393 žene) ili 6,9% svih smrtnih ishoda, a iza toga slijede zloćudne novotvorine dušnika i pluća (2802 umrla ili 5,6%) te zloćudne novotvorine debeloga crijeva (2037 umrlih ili 4%).<sup>4</sup>

Temelj za nastanak AIM-a, najčešće aterosklerotske kardiovaskularne bolesti, jesu nezdrav životni stil, nedostatna tjelesna aktivnost i pušenje cigareta. Spomenute štetne navike najprije se manifestiraju čimbenicima kardiovaskularnog rizika, slijedi supklinička bolest, a potom i neka od kliničkih manifestacija (angina pectoris, AIM, kronično zatajivanje srca, periferna arterijska bolest, moždani udar ili iznenadna srčana smrt). Ovisno o prepoznavanju spomenutih faza bolesti primjenjuju se različiti terapijski postupci – od mjera promjene nezdravoga životnog stila i farmakoterapije, odnosno mjera primarne i sekundarne prevencije, koje uključuju i programe kardiovaskularne (KV) rehabilitacije (slika 1).<sup>5,6</sup>

Cjeloviti pristup temelj je KV rehabilitacije koja obuhvaća procjenu individualnog rizika, doziranu tjelesnu aktivnost, kontrolu KV čimbenika rizika, terapijsku edukaciju i savjetovanje, intervencije usmjerene na psihičko funkcioniranje i ponašanje pacijenta te ocjenu radne sposobnosti.<sup>6,7</sup>

Glavni zadaci KV rehabilitacije<sup>5,7</sup> jesu:

- ponovno osposobljavanje pacijenta za funkcioniranje u obitelji, društvu i radnim aktivnostima
- poticanje pacijenta na promjenu načina života i na preuzimanje odgovornosti za vlastito zdravlje
- usporiti ili zaustaviti napredovanje bolesti.

ever, despite improved treatment of CHD, an organized network of primary percutaneous intervention for treatment of acute myocardial infarction (AMI), and consistent application of evidence-based measures of secondary prevention, a significant number of persons still dies from this disease. Data from the Croatian National Institute of Public Health on the number of deaths in 2013 show that AMI is one of the most common single causes of death in Croatia, at 3456 persons (2063 men and 1393 women) or 6.9% of all mortal outcomes, followed by lung cancers (2802 deaths, or 5.6%) and colorectal cancer (2037 deaths or 4%).<sup>4</sup>

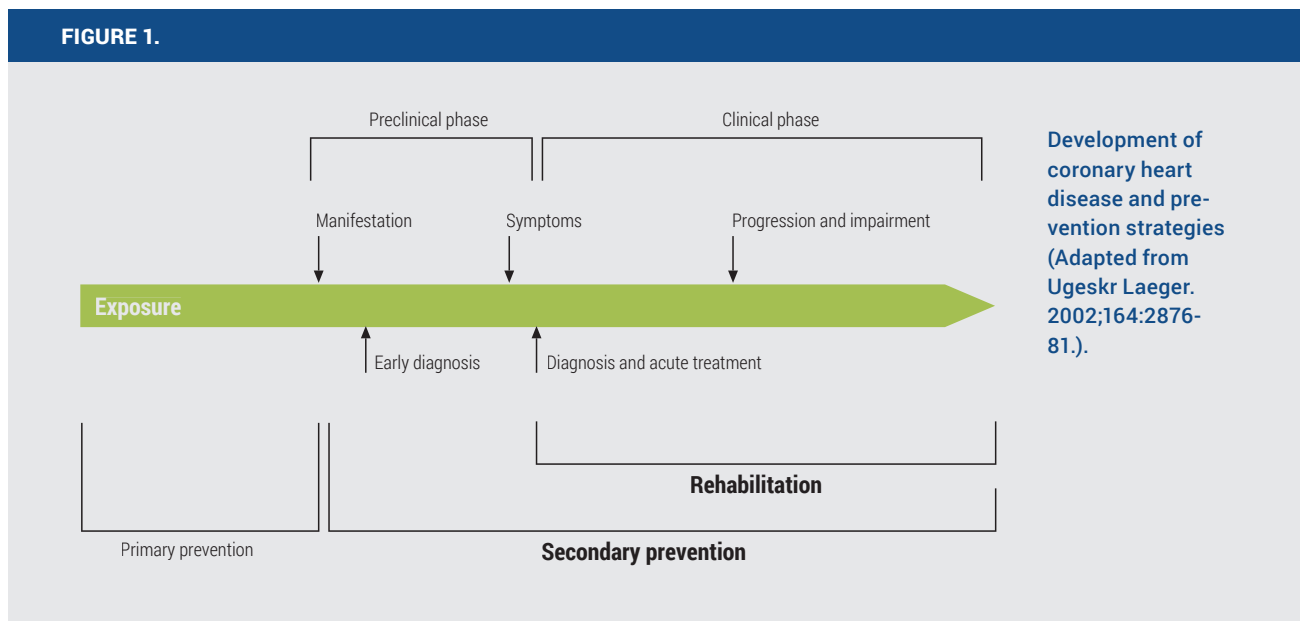
The basis for the development of AMI, the most common cardiovascular disease, is an unhealthy lifestyle, insufficient physical activity, and smoking. These unhealthy habits first manifest with cardiovascular risk factors, followed by sub-clinical disease, and finally one of the clinical manifestations (angina pectoris, AMI, chronic heart failure, peripheral artery disease, stroke, or sudden cardiac death). Depending on when the phase in which the disease is noticed, various treatments can be applied ranging from changing unhealthy lifestyle habits and pharmacotherapy, i.e. primary and secondary preventive measures, which include cardiovascular (CV) rehabilitation (Figure 1).<sup>5,6</sup>

A holistic approach is the basis of CV rehabilitation, and includes individual risk assessment, moderated physical activity, management of CV risk factors, education and counseling, interventions focused on the psychological behavior of the patients, and work fitness assessment.<sup>6,7</sup>

The main goals of CV rehabilitation<sup>5,7</sup> are:

- Restoring the patient's ability to function as part of a family, in society, and in work-related activities;
- Encouraging the patient to change their lifestyle and take responsibility for their own health;
- Slow down or prevent the progression of the disease.

FIGURE 1.



## Kontinuum kardiovaskularne rehabilitacije

Prema tradicionalnoj podjeli KV rehabilitacija provodi u tri (prema nekim autorima, u četiri) faze<sup>1,7</sup>.

1. **U vrijeme bolničkog liječenja** – u jedinici koronarne ili kardiokirurške intenzivne skrbi počinje se s **ranom mobilizacijom bolesnika** koja uključuje pravilno pozicioniranje bolesnika u krevetu, facilitaciju okretanja, posjedanja i ustajanja bolesnika iz postelje i pripremu za hodanje uz praćenje vitalnih pokazatelja i hemodinamskih vrijednosti radi povećanja oksigenacije, perfuzije i mišićnog tonusa te prevencije komplikacija. Bolesnike se upoznaje s mjerama sekundarne prevencije KV bolesti, čime se sprječava smanjenje tjelesne kondicije i postiže povoljan psihološki učinak. Kako je, zbog primjene modernih metoda liječenja, ovo razdoblje sve kraće (u nekih bolesnika i manje od 5 dana), iznimno je bitno navrijeme i adekvatno informirati pacijenta o stanju bolesti i predstojećem oporavku;
2. **Tijekom oporavka** – provodi se u **specijaliziranim ustanovama** za KV rehabilitaciju čije programe karakterizira timski rad (interdisciplinarni i transdisciplinarni pristup), kontinuirani nadzor kardiologa te telemetrijsko praćenje elektrokardiograma tijekom tjelesne aktivnosti. Tradicionalno se provodi u **bolničkim centrima** tijekom **21 dana**, a u **ambulantnim centrima** **3 do 5 puta tjedno** tijekom **3 mjeseca**. U oba modaliteta KV rehabilitacije postupno se dopušta veći stupanj tjelesne aktivnosti prema općeprihvaćenim načelima. Nakon provedene neinvazivne KV dijagnostike i psihodijagnostike daju se informacije o stanju. Bolesnik i njegova obitelj educiraju se i savjetuju o bolesti, daljnjem liječenju i ponašanju sa svrhom poticanja promjena zdravstvenog ponašanja i smanjenja negativnih psihosocijalnih posljedica bolesti;
3. **Dugotrajno održavanje** – provodi se u tzv. **klubovima srčanih bolesnika** koji se obično organiziraju uz rehabilitacijske centre i traje **doživotno**. Ovo razdoblje karakterizira održavanje i, ako je moguće unaprjeđenje, već postignutih učinaka KV rehabilitacije, uz povremene evaluacije internista-kardiologa, ergometrijska testiranja i kontrolu čimbenika rizika, a telemetrijsko se praćenje elektrokardiograma tijekom medicinske gimnastike ne provodi. Za praćenje bolesnika u razdoblju dugotrajnog održavanja najpogodniji je dobro educirani liječnik obiteljske medicine. Dugotrajno održavanje može se provoditi i u sportskim prostorima ili u pacijentovu domu nakon provedene KV rehabilitacije, bez nadzora zdravstvenih djelatnika, što pojedini autori nazivaju četvrtom fazom rehabilitacije.

## Dostupnost kardiovaskularne rehabilitacije u Republici Hrvatskoj

U Republici Hrvatskoj KV rehabilitacija provodi se u tri centra:

- u bolnici
  - Specijalna bolnica za medicinsku rehabilitaciju bolesti srca, pluća i reumatizma Thalassotherapia, Opatija (Referentni centar za kardiološku rehabilitaciju Ministarstva zdravstva Republike Hrvatske);

## Cardiovascular Rehabilitation Continuum

Traditionally, CV rehabilitation has three phases (or four, according to some authors)<sup>1,7</sup>.

1. **During hospital treatment** – in a coronary or cardiac surgery intensive care unit, **early mobility therapy** is applied, which includes proper positioning of the patient in bed, help with turning in bed, sitting up, and getting up from bed, as well as preparation for walking coupled with vital sign and hemodynamic value monitoring, aimed at improving oxygenation, perfusion, and muscle tone as well as prevention of complications. Patients are informed of secondary prevention measures for CV diseases, which prevents a drop in physical fitness and has a positive psychological impact. Due to application of increasingly advanced methods, this period is becoming shorter (less than five days in some patients), it is extremely important to provide timely information on the state of the disease and impending recovery process;
2. **During recovery** – this phase of CV rehabilitation takes place in **specialized institutions** characterized by teamwork (an interdisciplinary and transdisciplinary approach), continuous monitoring by a cardiologist, and telemetric electrocardiogram monitoring during physical activity. It is usually performed in **hospital centers over 21 days**, and in **outpatient centers 3-5 times a week over three months**. In both cases, physical activity is gradually increased according to generally accepted principles. After non-invasive CV and psychological diagnostics, the patient is informed of the state of their disease. The patient and family are then educated and counseled on the disease as well as further treatment and behavior aimed at encouraging changes in health behavior and reducing negative psychosocial consequences of the disease;
3. **Long-term maintenance** – this phase takes place in so called **cardiac patient clubs** that are usually organized in rehabilitation centers, and lasts **for the rest of the patient's life**. This phase is characterized by maintenance, and if possible improvement, of existing improvements achieved by CV rehabilitation, along with intermittent evaluations by internist-cardiologists, exercise stress test, and risk factor assessment, but with no telemetric electrocardiogram monitoring during physical activity. Patient follow up is most appropriately performed by a well-informed family physician. Long-term maintenance can also take place in sports facilities or in the patient's home without medical supervision, which some authors consider to be the fourth phase of CV rehabilitation.

## The Availability of Cardiovascular Rehabilitation in the Republic of Croatia

In the Republic of Croatia, CV rehabilitation takes place in three centers:

- **In the hospital**
  - Thalassotherapia Opatija – Special Hospital for Medical Rehabilitation of Heart and Lung Diseases and Rheumatism, Opatija (Referent Center for Cardiological Rehabilitation of the Ministry of Health, Republic of Croatia)

- Specijalna bolnica za medicinsku rehabilitaciju, Krapinske Toplice;

- **ambulantno**

- Poliklinika za prevenciju kardiovaskularnih bolesti i rehabilitaciju, Zagreb.

Već iz samog broja i smještaja centara rehabilitacije u Hrvatskoj može se zaključiti da mnogi pacijenti neće moći sudjelovati u programima KV rehabilitacije zbog ograničenih kapaciteta i geografske (ne)dostupnosti. Stoga se svim pacijentima koji imaju KBS, odnosno preboljeli su AIM, treba savjetovati tjelesna aktivnost radi dobrobiti koja ona donosi te kontrola KV čimbenika rizika. Uobičajeno se savjetuje *brzo hodanje* do nastupa blagoga stupnja zaduhe. Sve pacijente potrebno je educirati o načinu i važnosti *kontrole frekvencije srca* i arterijskog tlaka, a bilo bi poželjno uputiti ih u *govorni test* (vježbanje do razine brzog hodanja koje omogućuje izgovor kratkih rečenica) koji bi odgovarao primjerenj razini opterećenja za kardiološke pacijente.<sup>8</sup>

## Ciljevi programa kardiovaskularne rehabilitacije

Ciljevi programa ne ovise o vrsti centra za KV rehabilitaciju, nego su usmjereni na dobrobit pacijenta, i to na:

- smanjenje smrtnosti i pobola
- smanjenje simptoma bolesti, poglavito učestalosti anginoznih tegoba, zaduhe i umora
- bolje podnošenja napora
- poboljšanje radne sposobnosti
- bolja regulacija arterijskoga tlaka, smanjenje frekvencije srca
- poboljšanje vrijednosti lipida i glukoze u serumu
- smanjenje i prevencija prekomjerne tjelesne težine i pretilosti
- prestanak pušenja cigareta
- poboljšanje osjećaja dobroga zdravlja i smanjenja stresa
- poboljšanje kvalitete života.

## Ambulantna kardiovaskularna rehabilitacija u Republici Hrvatskoj

Druga faza KV rehabilitacije nastavlja se na kontinuum skrbi za kardiovaskularnog pacijenta nakon akutnoga bolničkog kardiološkog ili kardiokirurškog liječenja. U ambulantnim uvjetima uobičajeno se provodi tijekom 12 tjedana u bolesnika koji imaju nizak i umjereni rizik, dok se u bolesnika visokog rizika KV rehabilitacija provodi u specijaliziranoj bolnici.<sup>1</sup>

Poliklinika za prevenciju kardiovaskularnih bolesti i rehabilitaciju djeluje od 1950. godine u Zagrebu. Ambulantna kardiovaskularna rehabilitacija (AKVR) u Poliklinici provodi se kontinuirano od 1982. godine.<sup>7,9-11</sup> Uključuju se osobe starije od 18 godina, a troškove usluga plaća Hrvatski zavod za zdravstveno osiguranje (HZZO) putem uputnice mjerodavnog liječnika obiteljske medicine. Godišnjim ugovorom HZZO-a s Poliklinikom određen je maksimalan iznos novčanih sredstava do koje se mogu ispostaviti računi za provođenje specijalističko-konzilijarne zdravstvene zaštite.

- Special Hospital for Medical Rehabilitation, Krapinske Toplice, Croatia;

- **Outpatient**

- Institute for Cardiovascular Prevention and Rehabilitation, Zagreb, Croatia.

Simply looking at the number and location of rehabilitation centers in Croatia makes it clear that many patients will be unable to participate in CV rehabilitation programs due to their geographical location. Therefore, all patients with CHD or that had had AMI must be advised to take part in physical activity due to its benefits in addition to CV risk factor management. Brisk walking until slightly out of breath is usually advised. All patients must be educated on the methods and importance of heart rate control and arterial pressure, and it would be advisable to explain the talk test (exercise until the point that still allows them to speak short sentences) which would be an appropriate level of exertion for cardiac patients.<sup>8</sup>

## Goals of Cardiovascular Rehabilitation Programs

The goals of the program do not depend on the type of center CV rehabilitation is being performed in, but are instead focused on the wellbeing of the patient, specifically on:

- Reducing mortality and morbidity;
- Reducing the symptoms of the disease, in particular the frequency of chest pain, shortness of breath, and fatigue;
- Better exertion tolerance;
- Improving work fitness;
- Better blood pressure regulation, reduction of the heart rate;
- Improving lipid and glucose serum values;
- Reducing body weight and preventing obesity;
- Smoking cessation;
- Achieving a feeling of good health and reducing stress;
- Improving quality of life.

## Outpatient Cardiovascular Rehabilitation in the Republic of Croatia

The second phase of CV rehabilitation is part of the treatment of cardiovascular patients after acute hospital cardiologic or cardiac surgery treatment. In outpatient conditions, it usually takes place over 12 weeks in low and moderate risk patients, whereas in patients with high risk CV rehabilitation takes place in specialized hospitals.<sup>1</sup>

The Institute for Cardiovascular Prevention and Rehabilitation has been working since 1950 in Zagreb. Outpatient cardiovascular rehabilitation (OCVR) at the Institute has been performed continuously since 1982.<sup>7,9-11</sup> Patients above 18 years of age are included, and the treatment is paid for by the Croatian Health Insurance Fund based on referral by the family physician. An annual contract between the Croatian Health Insurance Fund and the Institute determines the maximum funding available for covering the bills for specialist health care.

Od 1. rujna 2013. godine u primjeni je uputnica za ambulantno liječenje oznake D1 koja pokriva liječenje 365 dana od uključanja.

Program AKVR **indiciran je** u bolesnika nakon:

- akutnoga koronarnog sindroma, odnosno akutnog infarkta miokarda
- kardiokirurškog zahvata (operacija aortokoronarnog premoštenja, ugradnje mehaničkog ili biološkog zaliska, reparacije zaliska, operacije aneurizme i drugih operacija)
- implantacije elektrostimulatora ili drugoga medicinskog uređaja s funkcijom elektrostimulacije/defibrilacije
- perkutane koronarne intervencije s implantacijom stenta ili perkutane koronarne angioplastike
- transplatacije srca
- simptomatskog oblika obliterirajuće bolesti perifernih arterija (osim teške ishemije i bolova u mirovanju) i dr.

Ustrajnost je pacijenata u provedbi programa velika i kretala se od 86 do 99%, osim u vrijeme Domovinskog rata, kada je pala na manje od 80%. Podatci iz svjetske literature navode 34 – 75%-tnu ustrajnost.<sup>7</sup>

Vlastitim višegodišnjim praćenjem ustanovili smo da je šestogodišnja smrtnost u skupini bolesnika koja je obavila 1. i 2. fazu rehabilitacije bila 13%, od toga samo polovica zbog srčanih uzroka. Smrtnost u skupini pacijenata koji nisu polazili programe 2. i 3. faze rehabilitacije iznosila je 34%, od čega čak ¾ zbog kardiovaskularnih uzroka.<sup>7</sup>

Rizik od tjelesnog treninga za zdravlje pokazao se iznimno malim: tijekom 400 000 sati medicinske gimnastike tijekom AKVR-a zabilježili smo jedan srčani arrest, jedan akutni infarkt miokarda, jedan moždani udar, ali bez smrtnog ishoda.<sup>7</sup>

### BROJ UKLJUČENIH PACIJENATA

Program AKVR u Poliklinici godišnje polazi oko 450 pacijenata. Na **slici 2** prikazan je broj uključenih pacijenata u program

Since September 1, 2013, Croatian Health Insurance Fund introduced a special D1 referral form for ambulatory care, which covers the treatment for 365 days from its start.

OCVR treatment is **indicated** in patients after:

- Acute coronary syndrome, i.e. acute myocardial infarction;
- Cardiac surgery (coronary artery bypass surgery, mechanical or biological valve implantation, valve repair, aneurism surgery, etc.);
- Heart electrostimulator implantation or implantation of other medical devices with a similar function;
- Percutaneous coronary intervention with stent implantation or percutaneous coronary angioplasty;
- Heart transplant;
- Symptomatic form of obliterating peripheral artery disease (except serious ischemia and pain at rest), etc.

Patient compliance in these programs is high, ranging from 86% and 99%, except during the Croatian War of Independence, when it was below 80%. Data from international studies show 34-75% compliance.<sup>7</sup>

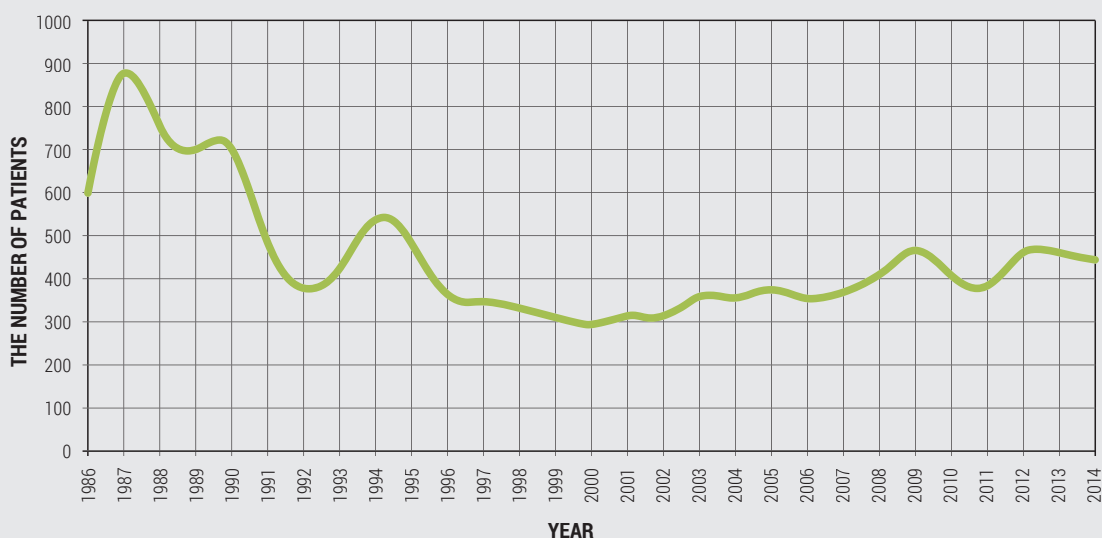
Our follow up for many years found that six-year mortality in patients that went through phases 1 and 2 of CV rehabilitation was 13%, only half of which due to heart-related causes. Mortality in patients that did not take part in phases 2 and 3 of the rehabilitation was 34%, of which as much as three quarters due to cardiovascular causes.<sup>7</sup>

The risk of physical training was extremely low: during 400 000 hours of exercise as part of OCVR we had only one cardiac arrest, one acute myocardial infarction, and one stroke, with no fatalities.<sup>7</sup>

### THE NUMBER OF PARTICIPATING PATIENTS

Approximately 450 patients attend the OCVR program annually in our Institute. **Figure 2** shows the number of patients

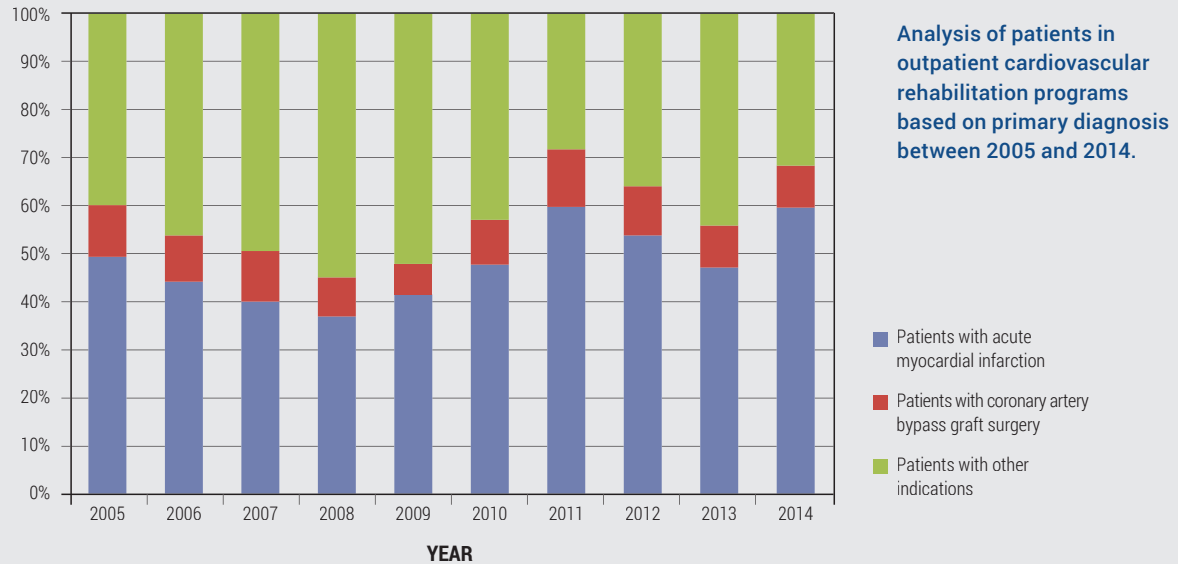
FIGURE 2.



The number of patients taking part in outpatient cardiovascular rehabilitation at the Institute for Cardiovascular Prevention and Rehabilitation from 1986 to 2014.



FIGURE 3.



AKVR od 1986. do 2014. godine. U spomenutom je razdoblju bilo ukupno uključeno 13 009 pacijenata.

Većina uključenih pacijenata dolazi po preporuci nadležnog kardiologa, internista, liječnika obiteljske medicine ili kardiološkog kirurga. Oko trećine pacijenata uključeno je nakon upućenog poziva poštom na temelju podataka o pacijentima s akutnim koronarnim sindromom u svim zagrebačkim bolnicama, što ih je neposredno prikupio djelatnik Poliklinike.

Na **slici 3** prikazana je analiza pacijenata uključenih u AKVR prema vodećim dijagnozama u razdoblju od 2005. do 2014. godine. Oko polovice uključenih pacijenata preboljelo je akutni infarkt miokarda, a u oko 10 % njih učinjeno je aortokoronarno premoštenje.

Osim AKVR-a, u Poliklinici se provodi i edukacija zdravstvenih djelatnika, studenata i ciljanih rizičnih skupina (npr. pretile osobe<sup>12</sup>, slabovidne i slijepo osobe<sup>13</sup>, preventivni KV pregledi osoba u rizičnoj životnoj dobi<sup>14</sup> i dr.).

Poliklinika je ovlaštena za provođenje specijalističkog staža iz uže specijalnosti interne medicine – kardiologije za dio edukacije iz rehabilitacije KV bolesnika, ocjene radne sposobnosti i prevencije KV bolesti. U suradnji sa Zdravstvenim veleučilištem u Zagrebu provodi se edukacija studenata prediplomskog stručnog studija Fizioterapije iz kolegija *Rehabilitacija srčanih bolesnika* i *Kliničke vježbe II* te edukacija studenata na specijalističkom diplomskom studiju Kliničkog sestinstva iz modula *Medicinska sestra u dijagnostici*.

Svi profili zdravstvenih djelatnika sudjeluju u trajnoj medicinskoj izobrazbi. Rezultati svakodnevnog rada redovito se objavljuju na domaćim i međunarodnim skupovima i periodično u indeksiranim publikacijama. Bibliografija objavljenih radova dostupna je na mrežnoj stranici Poliklinike.<sup>15</sup>

in the OCVR program from 1986 to 2014, for a total of 13009 patients.

Most patients are referred by their cardiologist, internist, family physician, or cardiac surgeon. About a third of the patients began participation after a mail invitation based on data on patients with acute coronary syndrome from all hospitals in Zagreb, directly acquired by an employee of the Institute.

**Figure 3** shows the analysis of patients in OCVR programs based on primary diagnosis between 2005 and 2014. Approximately half of the patients had suffered acute myocardial infarction, and about 10% had undergone coronary artery bypass surgery.

In addition to OCVR, the Institute also has education programs for other medical professionals, students, and target high-risk groups (e.g. obese persons<sup>12</sup>, vision impaired and blind persons<sup>13</sup>, preventive CV exams for people in higher-risk age groups<sup>14</sup>, etc).

The Institute is authorized to train residents in the subspecialty of internal medicine – cardiology related to the education about rehabilitation of patients with cardiovascular disease, work fitness assessment, and CV disease prevention. In cooperation with the University of Applied Health Studies, Zagreb, we take part in the education of students for the courses on *Rehabilitation of patients with heart disease* and *Clinical skills II* in the professional undergraduate program Physical therapy and for the module *Role of medical nurse in diagnostics* in the specialist graduate program Clinical nursing.

Health professionals of all profiles take part in constant medical training. Daily results are regularly published on national and international conferences, as well as periodically in indexed journals. A list of published articles is available on the Institute's webpage.<sup>15</sup>

## SADRŽAJ I PROCES RADA

U sustavu i organizaciji AKVR-a u Poliklinici prihvaćeno je načelo sveobuhvatne rehabilitacije, sukladno europskim smjernicama.<sup>16</sup> U program AKVR uključuju se bolesnici unutar 12 mjeseci od akutnoga kardiološkog stanja, čija udaljenost od mjesta stanovanja do centra za rehabilitaciju iznosi do 50 km, odnosno zahtijeva putovanje u trajanju kraćem od 60 minuta. Program se provodi u jutarnjoj smjeni tijekom 3 mjeseca, od 3 do 5 puta na tjedan, što omogućuje od 42 do 64 dolaska.

Cjeloviti skup aktivnosti AKVR-a u Poliklinici uključuje:

- kardiopulmonalnu i vaskularnu terapiju – individualno dozirana medicinska gimnastika i funkcionalni aerobni trening kontroliran telemetrijskim praćenjem elektrokardiogramima uz mjerenje frekvencije srca i arterijskoga tlaka
- neinvazivnu KV dijagnostiku
- nefarmakološke mjere kontrole čimbenika rizika i dokazano djelotvornu kardiološku terapiju u sekundarnoj prevenciji KBS-a
- terapijsku edukaciju pacijenata i obitelji
- psihodijagnostičku obradu i savjetovanje.

Osim sveobuhvatnosti, bitna je i **optimalna doza** KV rehabilitacije koja je potrebna za implementaciju svih mjera. Dokazano je da bi djelotvorna AKVR trebala uključivati najmanje 36 termina, što osigurava zaštitno djelovanje na dugoročne ishode (smrtnost i nastanak infarkta miokarda) tijekom četiri godine od uključanja.<sup>17</sup>

Nakon početnog pregleda i evaluacije pacijent se svrstava u jednu od postojećih pet skupina opterećenja, sukladno opsegu oštećenja, srčanoj funkciji, dobi, funkcijskom statusu i drugim mogućim bolestima. Opće, stanje KV i lokomotornog sustava poboljšava se doziranim treningom koji, uz to, podiže i bolesnikovo samopouzdanje. Odgovarajućim psihološkim pristupom utvrđuju se mogući psihološki čimbenici rizika, pomaže u promjeni neprikladnih oblika ponašanja i razvijaju vježbe opuštanja i nošenja sa stresom. Posebice se pacijentima nastoji pomoći da se oslobode straha i depresije koji su gotovo uvijek prisutni nakon akutne kardiološke bolesti. Edukacijom se pomaže bolesnicima da vode zdrav način života izbjegavajući čimbenike koji su doveli do bolesti te da se pridržavaju propisane terapije. Socijalni ciljevi jesu održavanje neovisnog stila života, povratak poslu i svakodnevnim dužnostima, kao i obnavljanje obiteljskih i društvenih uloga.<sup>7,9-11</sup>

Proces organizacije rada AKVR-a u Poliklinici može se sažeti u sedam koraka:

**0 – identificiranje i upućivanje kandidata** u centar KV rehabilitacije: preporuka liječnika ili poziv poštom,

**1 – obrada prijave:** početno upoznavanje pacijenta s kardiologom i radom centra te sadržajem programa AKVR,

**2 – početna evaluacija pacijenta:** procjena rizika i intenzitetske grupe nakon:

- uvida u medicinsku dokumentaciju
- učinjene anamneze i kliničkoga pregleda s antropometrijskim mjerenjima
- učinjenog nalaza 12-kanalnog elektrokardiograma i ergometrijskog testiranja
- ispunjenog obrasca za prijam na AKVR

## CONTENTS AND ORGANIZATION OF THE PROGRAM

The organization of OCVR at the Institute is based on the principle of holistic rehabilitation, in line with European guidelines.<sup>16</sup> The OCVR program accepts patients within 12 months from their acute cardiologic state, living up to 50 km from the Institute, requiring less than 60 minutes of transit time. The program takes place during the morning shift, three to five times a week over three months, which allows for 42 to 64 sessions.

The activities included in the OCVR program in the institute are:

- Cardiorespiratory and vascular therapy – individually tailored medical gymnastics and functional aerobic training controlled by telemetric electrocardiogram monitoring along with heart frequency and arterial pressure measurements;
- Non-invasive CV diagnostics;
- Non-pharmacological management of risk factors and evidence-based cardiologic therapy for secondary prevention of CHD;
- Education of the patient and family;
- Psychodiagnostic processing and counseling.

Apart from a holistic approach, "**optimal dosage**" is important in CV rehabilitation as well, to allow the implementation of all the measures. It has been proven that effective OCVR should include at least 36 sessions, which ensures a preventive effect on long-term outcomes (mortality and incidence of myocardial infarction) over the four years.<sup>17</sup>

After an initial examination and evaluation, the patient is placed into one of five existing intensity level groups based on the extent of the disease, heart function, age, functional status, and comorbidities. The general state of the CV and locomotor system is improved through measured training that also improves the patient's self-confidence. An appropriate psychological approach is used to ascertain possible psychological risk factors, help modify inappropriate behaviors, and develop relaxation and stress-reduction exercises. In particular, we aim to relieve the fear and depression that are almost always present after an acute cardiologic event. Education helps patients form healthy lifestyle habits and avoid factors that led to the disease, as well as improve treatment compliance. The social goals include achieving an independent lifestyle, returning to work and everyday duties, and resuming familial and social roles.<sup>7,9-11</sup>

The organization process of the OCVR program at our Institute can be summarized in seven basic steps:

**0 – identifying and referring the candidate** to a CV rehabilitation center: via doctor recommendation or mail invitation.

**1 – application processing:** initial familiarization of the patient with a cardiologist and the contents of the OCVR program.

**2 – initial patient evaluation:** assessing risk and intensity groups after:

- Analysis of the patient's medical documentation;
- History and clinical examination with anthropometric measurements;
- 12-lead electrocardiogram and exercise stress test;
- Filling out an application form for OCVR;

- ispunjenim upitnicima za ispitivanje percipiranog izvora kontrole zdravlja (ZLK-90-2), ocjeni stupnja anksioznosti i depresije HAD ljestvicom (engl. *Hospital Anxiety and Depression Scale*)
- eventualne ciljane početne obrade (24-satno kontinuirano snimanje EKG, 24-satno kontinuirano mjerenje arterijskoga tlaka, transtorakalna ehokardiografija, dodatne laboratorijske pretrage, psihodijagnostika i fizijatrijski pregled),

**3 – izrada individualnog plana AKVR-a:** individualno se određuju vrsta, intenzitet, trajanje i učestalost kardiorespiratorne i vaskularne terapije, potreba za opsegom neinvazivne KV dijagnostike, psihodijagnostičke obrade i savjetovanja te plan terapijske edukacije. U pravilu, 70–80% od opterećenja koje su pacijenti postigli na ergometrijskom testiranju pri uključenju uzeto je kao osnova za trening, uzimajući u obzir eventualno postojanje periferne arterijske bolesti, cerebrovaskularne bolesti, mogućnosti lokomotornog sustava, prisutnost komorbiditeta te pacijentovu želju,

**4 – provedba cjelovitoga programa AKVR,**

**5 – završna evaluacija pacijenta i preporuke:** ciljane pretrage prije otpusta, završna ocjena stupnja anksioznosti i depresije HAD ljestvicom, konzultacija s kardiološkim konzilijem,

**6 – otpust i daljnje praćenje:** podatci tijekom AKVR-a dokumentirani su u integriranom softverskom sustavu za obradu medicinske dokumentacije i otisnuti na otpusnom pismu koje sadržava sve nalaze učinjene obrade, preporuke za nefarmakološke postupke, farmakološko liječenje te potrebu za dodatnom obradom i praćenjem.

Kako prema sadašnjim pravilima uputnica oznake D1 vrijedi 365 dana, pacijentima koji to žele omogućuju se kardiološka obrada i kontrolni pregledi u Poliklinici tijekom tog razdoblja.

Na kraju AKVR-a pacijentima se pruža mogućnost uključivanja u dugotrajno održavanje koje postoji u Poliklinici (Klub srčanih bolesnika).<sup>7</sup> Pacijentima se procjenjuju rizik i intenzitetska grupa sukladno principima AKVR-a. Ova je faza je dobrovoljna, dio troška snosi sam pacijent, a dio Poliklinika. Fokusirana je na nastavak medicinske gimnastike koja se provodi dvaput tjedno, bez telemetrijskoga praćenja elektrokardiograma. Spomenutom mogućnošću može se koristiti 150 do 200 pacijenata godišnje tijekom jednog do više mjeseci.

## TERAPIJSKA EDUKACIJA PACIJENATA I OBITELJI/PARTNERA

Terapijsku edukaciju pacijenata i obitelji/partnera provode svi djelatnici rehabilitacijskog tima individualno i grupno putem savjeta, radionica i predavanja iz područja kardiologije, fizikalne medicine i rehabilitacije te psihologije i psihijatrije.

Tjedna edukacija pacijenata uključenih u AKVR provodi se u predavaonici Službe za ambulantnu rehabilitaciju u trajanju 45 do 60 minuta. Ciklusi od 12 predavanja održavaju se četiri puta godišnje, a sadržavaju sljedeće teme:

- Značenje bolesti srca i krvnih žila. Čimbenici KV rizika.
- Anatomija srca i krvnih žila. Osnove fiziologije srca i krvotoka. Najvažnija mjesta za nastanak aterosklerotskih promjena. Aterosklerotski plak. Koronarna bolest srca i njeni oblici.

- Filling out questionnaires on perceived health control sources (ZLK-90-2) and depression anxiety level assessment using the Hospital Anxiety and Depression Scale (HAD);
- Additional targeted tests (24 hour ambulatory blood pressure measurement, 24 hour ambulatory electrocardiographic monitoring, transthoracic echocardiography, additional laboratory tests, psychodiagnostics, and examination by a physical medicine specialist).

**3 – creating an individualized OCVR plan:** the type, intensity, duration, and frequency of cardiorespiratory and vascular therapy are individually tailored to the patient, as well as the scope of non-invasive CV diagnostic, psychodiagnostic processing and counseling, and education plan. In general, 70-80% of the ergometric exertion levels serve as a basis for the training, taking into consideration the possibility of peripheral artery disease, cerebrovascular disease, the capabilities of the locomotor system, comorbidities, and the patient's preferences.

**4 – implementation of the OCVR program.**

**5 – final evaluation of the patient and recommendations:** targeted tests before discharge, final assessment of anxiety and depression based on the HAD scale, guidance from cardiology consultation.

**6 – discharge and follow up:** data collected during OCVR is stored in an integrated software system for medical documentation processing and printed on the discharge letter, which lists all test results, non-pharmacological treatment recommendations, pharmacological treatments, and suggested further examination and follow up.

As the D1 referral form is valid for 365 days, patients who are so inclined are provided with cardiologic evaluation and follow-up examinations during that period.

After the OCVR program, patients are invited to participate in long-term maintenance at the Institute (Heart Patient Club).<sup>7</sup> Patients are assessed for risk and assigned intensity groups, in line with OCVR principles. This phase is voluntary, and the expenses are shared between the patient and the Institute. The focus is on continuing medicinal gymnastics training twice a week, with no telemetric electrocardiogram monitoring. This option can be used by 150 to 200 patients annually, over the course of one or more months.

## EDUCATION OF THE PATIENT AND FAMILY/PARTNER

Education of the patient and family/partner is performed by all members of the rehabilitation team both individually and in groups, using advice, workshops, and lectures from the fields of cardiology, physical medicine and rehabilitation, psychology, and psychiatry.

Weekly education of patients participating in OCVR takes place in the lecture hall of the Service for outpatient rehabilitation and lasts 45 to 60 minutes. A twelve-lecture cycle is held four times per year, dealing with the following topics:

- Importance of heart and blood vessel diseases. CV risk factors.
- Anatomy of the heart and blood vessels. Basics of heart physiology and blood flow. The most important places for the appearance of atherosclerotic changes. Atherosclerotic plaque. Coronary heart disease and its forms.



- Pravilna prehrana i način mršavljenja. Zdrava priprema hrane.
- Arterijska hipertenzija – povišeni krvni tlak. Dislipidemija – povišene razine masnoća u krvi. Metabolički sindrom – česta bolest današnjice. Šećerna bolest.
- Pušenje i kardiovaskularno zdravlje.
- Tjelesna aktivnost i KV bolesti.
- Bolesti lokomotornog sustava i KV bolesti.
- Indeks tjelesne mase. Opseg struka. Neinvazivna dijagnostika KV bolesti.
- Psihološki čimbenici značajni za razvoj KBS-a. Upravljanje stresom.
- Kardiovaskularni lijekovi i intervencijsko liječenje. Prevencija KV bolesti.
- Radnoterapijske intervencije u KV bolesnika.
- Svakodnevni život KV bolesnika.

Predavanja za obitelji/partnere uključenih pacijenata provode se jednom mjesečno i traju 60 – 90 minuta, a teme su ove:

- Svakodnevni život KV bolesnika
- Psihološki čimbenici značajni za razvoj KBS-a
- Radnoterapijske intervencije u KV bolesnika.

Iako se održavanje edukacijskog predavanja od travnja 2014. godine više ne može iskazati na računima prema HZ-ZO-u jer je ukinuta šifra postupka, edukacijski tim djelatnika Poliklinike nastavio je aktivnosti sukladno potrebama pacijenata i preporukama<sup>18</sup>.

U malim skupinama (do 5 pacijenata) provodi se ciljana edukacija u radionicama koje traju 45 minuta:

- Pravilno mjerenje srčane frekvencije i krvnoga tlaka
- „Putovnica za život“ – film na hrvatskom jeziku preporučan od Hrvatskoga kardiološkog društva te razgovor, savjetovanje i pisane upute o značenju i kontroli čimbenika KV rizika.

### DIJAGNOSTIČKE USLUGE

Sve dijagnostičke usluge na AKVR indicira kardiolog ovisno o kliničkoj slici, osnovnoj bolesti i komorbiditetu, a one uključuju:

- preglede kardiologa
- fizijatrijske preglede
- psihodijagnostiku, psihološko savjetovanje i psihosocijalnu edukaciju
- antropometrijska mjerenja
- mjerenje srčane frekvencije i arterijskoga tlaka
- 12-kanalni elektrokardiogram
- ergometrijsko testiranje
- telemetrijsko monitoriranje elektrokardiograma
- 24-satno kontinuirano mjerenje arterijskoga tlaka
- 24-satno kontinuirano snimanje EKG-a
- transtorakalnu ehokardiografiju
- kolor Doppler karotidnih arterija i vertebralnih arterija
- transkranijalni Doppler vertebralnih arterija
- Doppler arterija donjih udova

- Proper dieting. Healthy food preparation.
- Arterial hypertension – increased blood pressure. Dyslipidemia – increased levels of lipids in the blood. Metabolic syndrome – a common illness today. Diabetes.
- Smoking and cardiovascular health.
- Physical activity and CV disease.
- Diseases of the locomotor system and CV diseases.
- Body mass index. Waist circumference. Non-invasive CVD diagnostics.
- Psychological factors relevant to CHD. Managing stress.
- Cardiovascular medication and intervention. Prevention of CV disease.
- Occupational therapy interventions in CV patients.
- Everyday lives of CV patients.

Lectures for the families/partners of enrolled patients take place once a month, lastin 60-90. They cover the following topics:

- Everyday lives of CV patients.
- Psychological factors relevant to CHD development.
- Occupational therapy interventions in CV patients.

Although the educational activities cannot be reimbursed from the Croatian Health Insurance Fund since April 2014, the Institute's education team has continued their activities in line with recommendations and the needs of the patients.<sup>18</sup>

Targeted education is performed with small groups of patients (up to five) in workshops lasting for 45 minutes:

- Proper measurement of heart frequency and blood pressure.
- Screening of "Passport for Life" – a video recommended by the Croatian Cardiac Society followed by conversation, counseling, and written recommendations on the import and management of CV risk.

### DIAGNOSTIC SERVICES

All diagnostic services in OCVR are indicated by the cardiologist depending on the clinical picture, the primary disease, and comorbidity. Diagnostic services include:

- Examination by a cardiologist
- Examination by a physical medicine specialist
- Psychodiagnostics, psychological counseling, and psychosocial education
- Anthropometric measurements
- Measuring heart rate and blood pressure
- 12-lead electrocardiogram
- Exercise stress test
- Telemetric electrocardiogram monitoring
- 24 hour ambulatory blood pressure measurement
- 24 hour ambulatory electrocardiographic monitoring
- Transthoracic echocardiography
- Color Doppler ultrasonography of the carotid and vertebral arteries
- Transcranial Doppler ultrasonography of the vertebral arteries

- Doppler vena donjih udova
- osnovnu laboratorijsku dijagnostiku iz venskog uzroka krvi – SE, KKS, Tr, CRP, fibrinogen, glukoza, ukupni kolesterol, LDL, HDL, trigliceridi, urati, kreatinin, kalij, bilirubin, AST, ALT, GGT, AF, kalij, Fe, CK, LDH
- proširenu laboratorijsku dijagnostiku – PV, INR, CK-MB, troponin T, NT-proBNP, D-dimeri, APTV, ureja, natrij, OGTT, HbA1c, mikroalbuminurija, hormoni štitnjače, pregled mokraće
- opservaciju i monitoriranje vitalnih funkcija (arterijskoga tlaka, pulsa, elektrokardiograma, saturacije kisika) te primjena hitnoga medikamentnog liječenja
- kardiovaskularni konzilij
- preporuke za konzilijarne preglede – psihijatar, dijabetolog, vaskularni kirurg i druge specijalnosti
- scintigrafiju miokarda u opterećenju u suradnoj ustanovi.

Odluku o longitudinalnom praćenju rezultata pojedinih dijagnostičkih usluga tijekom AKVR-a donosi kardiolog, ovisno o indikaciji.

### TIM DJELATNIKA AMBULANTNE KARDIOVASKULARNE REHABILITACIJE

Članovi tima koji provodi AKVR u Poliklinici jesu kardiolozi, fizijatar s dodatnom edukacijom iz kardiološke rehabilitacije, klinički psiholog, prvostupnici sestrištva, fizioterapije i radne terapije, odnosno medicinske sestre i fizioterapeuti, a prema potrebi i drugi zdravstveni djelatnici. Prvostupnici sestrištva i fizioterapije dodatno su educirani iz dijetoterapije. Tim djelatnika na rehabilitaciji čini i kardiovaskularni konzilij.<sup>7,9,11,19</sup>

Slično drugim europskim centrima<sup>20</sup> voditelj, organizator i koordinator postupaka AKVR-a u Poliklinici jest kardiolog s dodatnom edukacijom iz hitne medicine koji je cijelo radno vrijeme prisutan u prostorima Službe AKVR-a. Rehabilitacijski se proces provodi u aktivnoj timskoj atmosferi, ne dijeli se unutar pojedinih grana, nego se nastoji primijeniti interdisciplinarni, a, kad je moguće, transdisciplinarni pristup radu. Kontinuirana edukacija cijeloga tima i razmjena informacija provodi se na redovitim tjednim sastancima.

S obzirom na prirodu bolesti, u pacijenata je stalno prisutan rizik od ozbiljnih KV komplikacija, što zahtjeva odgovarajuću dijagnostičku i terapijsku opremljenost te stalnu pripravnost na provođenje hitnih intervencija. Svi su članovi tima educirani za pružanje naprednih postupaka oživljavanja u slučaju kardiopulmonalnog zastoja.

**Uloga kardiologa** – Internist-kardiolog sudjeluje u svim aktivnostima tijekom AKVR-a – selekciji pacijenata za prijam, individualnoj evaluaciji rizika, neinvazivnoj KV dijagnostici, nadziranju pacijenata tijekom medicinske gimnastike i treninga, preporuci i korekciji medikamentnog liječenja sukladno nalazima, provodi savjetovanje i terapijsku edukaciju i pacijenata i njihovih obitelji te radi u konziliju. Nakon završenog razdoblja AKVR-a kardiolog završno evaluira provedeni postupak ponovno stratificirajući rizik od svakoga pojedinog bolesnika i daje završno mišljenje koje je vidljivo u otpusnom pismu.

- Doppler ultrasound of lower limb arteries
- Doppler ultrasound of lower limb veins
- Basic laboratory diagnostics from vein blood samples: ESR, full blood count, Tr, CRP, fibrinogen, glucosis, total cholesterol, LDL, HDL, triglycerides, urates, creatinine, potassium, bilirubin, AST, ALT, GGT, AF, blood iron, CK, and LDH
- Expanded laboratory diagnostics – PV, INR, CK-MB, troponin T, NT-proBNP, D-dimer values, APTV, urea, sodium, OGTT, HbA1c, microalbuminuria, thyroid hormones, urine testing
- Vital function monitoring (blood pressure, heart rate, electrocardiogram, oxygen saturation) and application of urgent medication treatment
- Cardiovascular consultation
- Recommendation for consultation examinations – psychiatrist, diabetologist, vascular surgeon, and other specialties
- Myocardial scintigraphy under loading in a collaborating institution

The decision on longitudinal follow-up of the results of individual diagnostic procedures during AKVR is made by a cardiologist, depending on the indication.

### THE OUTPATIENT CARDIOVASCULAR REHABILITATION TEAM

The members of the outpatient cardiovascular rehabilitation team at the Institute are: cardiologists, a physical medicine specialist with additional training in cardiovascular rehabilitation, a clinical psychologist, bachelors of nursing, physical and work therapy and nurses and physical therapists, and other medical personnel as needed. The bachelors of nursing and physical therapy have additional training in diet therapy. Experts performing cardiovascular consultation are also considered part of our team.<sup>7,9,11,19</sup>

As in other European centers<sup>20</sup>, the leader, organizer, and coordinator of the OCVR program at the Institute is a cardiologist with additional training in emergency medicine, who is constantly present in the OCVR facilities. The rehabilitation presses takes place in an atmosphere of active team-work and is not divided within particular fields, aiming at an interdisciplinary, and if possible transdisciplinary, approach. Continuous education and exchange of information of the whole team takes place on regular weekly meetings.

Considering the nature of the diseases these patients suffer from, the risk of serious CV complications is always present, which necessitates adequate diagnostic and treatment equipment and constant readiness for emergency interventions. All team members are trained in performing advanced resuscitation procedures in case of cardiopulmonary arrest.

**The role of the cardiologist** – the internist-cardiologists takes part in all OCVR activities – patient selection, individual risk evaluation, non-invasive CV diagnostics, monitoring patients during medical gymnastics and training, recommending and correcting medication treatment based on test results, counseling and education of patients and families, and cardiologic consultation. After the patient has finished the OCVR program, the cardiologist performs the final evalu-

**Uloga fizijatra** – Nakon procjene kardiološkoga statusa, fizijatar uzima detaljnu radnu anamnezu, obavlja klinički pregled, donosi procjenu lokomotornog statusa da bi AKVR bio što uspješniji i u punom opsegu za svakog pacijenta. Ako je potrebna dodatna obrada, ona se zatraži (RTG vratne, prsne, slabinske kralježnice, kukova i koljena, denzitometrija i dr.). Tijekom pregleda analizira se dokumentacija o lokomotornom sustavu, eventualna neurološka i neurokirurška dokumentacija, a po potrebi i nalazi drugih specijalista koji bi mogli utjecati na provođenje procesa KV rehabilitacije. Na kraju pregleda timski se donose preporuke i napomene pacijentu za medicinsku gimnastiku i postupke koje provode fizioterapeuti. Ako tijekom AKVR-a nastupe teškoće s dijelom lokomotornog sustava, obavi se kontrolni pregled, analizira eventualno prikupljena nova dokumentacija i daju preporuke pacijentu i fizioterapeutima u vezi s novonastalim teškoćama i potom se nastavlja postupak KV rehabilitacije. Tijekom provedbe AKVR-a prate se opseg pokreta i cjelokupni status u prvom i zadnjem pregledu.

Medicinska se gimnastika provodi pod nadzorom prvostupnika fizioterapije i fizioterapeuta te prvostupnika radne terapije, a izvodi se u stojećem, sjedećem i ležećem položaju na strunjači, stojeći uz švedske ljestve, vožnjom bicikla na nožni i ručni pogon i hodom po pokretnoj traci. Pri svim vježbama izvodi se korekcija koja uključuje individualne vježbe za vrat i ramena pred ogledalom 1/1, individualne vježbe za LS kralježnicu, individualne vježbe za kukove, individualne vježbe za koljena, individualne upute pacijentu o pravilnom držanju u vrijeme sjedenja, rada, ležanja, čitanja, o primjerenoj obući. Nadzor nad pacijentima u dvorani u vrijeme izvođenja AKVR-a provodi se redovito uz korekciju terapije.

**Uloga psihologa** – Nakon KV obrade, psiholog u AKVR-u obavlja pet skupina poslova: psihodijagnostiku, savjetovanje, edukaciju, grupni tretman po bihevioralno-kognitivnim načelima i rad u konziliju. Psihodijagnostika obuhvaća dvije vrste aktivnosti – testiranje i razgovor/intervju. Testiranje je usmjereno na procjenu pacijentova emocionalnoga stanja (općeg /Cornell indeks/ i pojedinačnih elemenata – anksioznosti /STAI/ i depresivnosti /BDI/), zdravstvenog lokusa kontrole /ZLK-90/ i procjenu trenutačnog funkcioniranja ličnosti (Wartegg, projektivni test). Intervju zahvaća provjeru širokog aspekta emocionalnog, kognitivnog, tjelesnog, socijalnog i profesionalnog funkcioniranja bolesnika, uz procjenu kapaciteta za suočavanje s bolešću i predviđanje komunikacije sa zdravstvenim osobljem. U pravilu se odigrava tijekom jednokratnog razgovora i testiranjem, a pokatkad je potrebna i heteroanamnestička procjena.

Sadržaj i opseg savjetovanja ovisi o konkretnom bolesniku, njegovoj primarnoj bolesti, komorbiditetima i eventualnim psihološkim teškoćama.<sup>24</sup> Savjetovanje se najčešće obavlja tijekom intervjuja, a po potrebi i u dodatnim susretima na tjednoj bazi. Psiholog drži dva predavanja o psihološkim čimbenicima rizika za KBS u sklopu redovitog ciklusa predavanja za pacijente i članove njihovih obitelji.

Pacijentima na AKVR-u ponuđen je rad u grupi za opuštanje i za mršavljenje u malim zatvorenim grupama. U grupi za opuštanje uče se ove vještine: dijafragmalnog disanja, vođenog zamišljanja, pravilne komunikacije, suočavanja sa srdžbom, asertivnosti, shema rješavanja problema, prepoznavanja

ation of the procedure, reassessing risk for every patient and providing a final overview in the discharge letter.

**The role of the physical medicine specialist** – after cardiologic status evaluation, the physical medicine specialist takes a detailed working anamnesis, performs a clinical examination, and assesses the locomotor status in order to make OCVR as successful for every patient. When further examination is needed, it is requested (X-ray of the cervical, thoracic and lumbar spine, X-ray of the hips or knees; densitometry, etc.). During the examination, the medical documentation related to the locomotor system as well as neurological and neurosurgical documentation is analyzed, in addition to the findings of other specialists that could influence the OCVR process. Finally, the team jointly issues recommendations for medical gymnastics and physical therapy. If there are problems with parts of the locomotor system during OCVR, a control examination is performed and the new medical data is analyzed, and the patient and physical therapists are given further recommendations on dealing with the emerging issues, after which the OCVR program continues. During the OCVR program, the range of movement and general status at first and last examination is monitored.

Medical gymnastics take place under the supervision of a bachelor of physical therapy and a physical therapist, as well as bachelor of occupational therapy. Exercises include standing, sitting, and lying down on a mat, wall ladders, riding a bicycle using legs or arms and walking on a treadmill. During training, therapeutic correction includes individual exercises for the neck and shoulders in front of the mirror, individual exercises for lumbosacral spine, specialized exercises for the hips and knees, instructions to individual patients on proper sitting, working, lying, and reading positions, and appropriate footwear. Supervision of patients in the exercise room during AKVR is continual, with necessary correction in therapy.

**The role of the psychologist** – after CV processing, the psychologist performs five groups of tasks in OCVR: psychodiagnostics, patient counseling, education, group therapy based on behavioral-cognitive principles, and participating in cardiovascular consultation. Psychodiagnostics includes two types of activity – testing and conversation/interviews. Testing is focused on the evaluation of the patient's emotional state (general /Cornell Medical Index/ and individual elements – anxiety /STAI/ and depression /BDI/) and health locus of control /HLK-90/, as well as assessment of current personality functioning (Wartegg, projection test). The interview check for a wide range of emotional, cognitive, physical, social, and professional functionality in the patient, in addition to assessment of the capacity to face the illness and prediction about the communication with health personnel. This assessment generally takes place during a one-time conversation and testing, but heteroanamnestic evaluation is sometimes required.

The contents and scope of the counseling depends on the patient, their primary disease, comorbidities, and possible psychological difficulties.<sup>24</sup> Counseling usually takes place during the interview, and if needed in additional weekly sessions. The psychologist gives two lectures on psychological risk factors for CHD as part of the regular lecture cycle for patients and their families.

Patients attending OCVR are offered to take part in a small, closed relaxation and weight-reduction groups. The relaxation

i pravilnog nošenja s manipulacijom i dr. U grupi za mršavljenje radi se na kontroli podražaja koji dovode do jedenja i na kontroli procesa hranjenja, postupnom smanjenju dnevnoga energijskog unosa uz pravilan izbor i kombinaciju namirnica ovisno o individualnim čimbenicima rizika. Obje se grupe sastaju jednom tjedno.

Psiholog sudjeluje u radu KV konzilija i informira članove o psihološkim čimbenicima rizika te o osobinama ličnosti konkretnog bolesnika.

U Poliklinici se također provodi edukacija studenata psihologije s Filozofskog fakulteta i Hrvatskih studija.

**Uloga kardiovaskularnog konzilija** – Stručni KV konzilij čine predstavnici kardioloških odjela zagrebačkih bolnica i djelatnici Poliklinike (kardiolozi, psiholog, prvostupnica sestrištva). Održava se, u pravilu, jedanput na tjedan. Pacijenta se predstavlja na KV konziliju na temelju medicinske dokumentacije:

- kada je potrebna konzilijarna procjena zdravstvenog stanja i odluka o daljnjoj dijagnostici i liječenju
- kada je potrebno osigurati termine za diferencijalnu obradu u bolničkim ustanovama.

Konzilij daje i druge potrebne sugestije za rad Službe za AKVR.<sup>7</sup> S obzirom na propisane odluke, konzilij više ne sudjeluje u formiranju mišljenja o radnoj sposobnosti, odnosno privremenoj nesposobnosti za rad.

**Uloga prvostupnika fizioterapije/fizioterapeuta** – Fizioterapijski tretman počinje fizioterapijskom primjenom SOAP (*Subjective, Objective, Assessment, and Plan*) i ICF (*The International Classification of Functioning, Disability and Health*) modela procjene, postavljanjem i planiranjem ciljeva te evaluacijom i dokumentiranjem učinaka.<sup>22</sup> Fizioterapijska procjena (subjektivna i objektivna) definirana je:

- mjerenjem antropometrijskih karakteristika (visina, težina, indeks tjelesne mase, opseg struka, opseg bokova, omjer opsega struka i bokova)
- edukacijom pacijenta o vještini mjerenja pulsa i arterijskoga tlaka u svakodnevnim aktivnostima
- mjerenjem pulsa i arterijskoga tlaka prije, tijekom i nakon treninga
- telemetrijskim monitoriranjem elektrokardiograma; prepoznavanjem pridruženih KV smetnji i komorbiditeta
- prepoznavanjem potrebe za daljnjom dijagnostikom
- ispunjavanjem liste tegoba
- konzultacijom s kardiologom i ostalim članovima rehabilitacijskog tima
- promjenom fizioterapijske intervencije.

Fizioterapeut primjenjuje odgovarajuće postupke kardiorespiratorne i vaskularne terapije:

- medicinske gimnastike koja se sastoji od:
  - postupnog uvođenja u trening laganim vježbama disanja, zagrijavanja, istezanja
  - punog treninga – vježbama/aktivnostima aerobnog tipa, ciljanog intenziteta, frekvencije i trajanja
  - hlađenja – postupnog izlaska iz aktivnosti

group teaches the following skills: diaphragmatic breathing, facilitating relaxation, adequate communication skills, anger management, assertiveness, problem-solving schemes, recognizing and coping with manipulation, etc. The weight reduction group focuses on the control of the stimuli which lead to eating, and the control of alimentary processes. Gradual reduction of daily energy intake values coupled with proper ingredient choices and combinations depending on individual risk factors. Both groups meet once a week.

The psychologist takes part in cardiovascular consultation and informs other members on the psychological risk factors and characteristics of the particular patient's personality.

The Institute also provides education for psychology students from the Faculty of Philosophy and Centre for Croatian studies.

**The role of cardiovascular consultation** – expert cardiovascular consultation is provided by representatives of the Cardiology Departments of various hospitals in Zagreb and the employees of the Institute (cardiologists, a psychologist, a bachelor of nursing). A session generally takes place once a week. A patient is presented to the consultants based on medical documentation:

- When cardiovascular consultation is required to assess the health of the patient and reach a decision on further diagnostics and treatment;
- When it is necessary to secure appointments for differential management in the hospital setting.

Cardiovascular consultation provides other suggestions for the AKVR Service.<sup>7</sup> With respect to the prescribed decision, the consultation does not take part in the final decision on work ability, i.e. temporary work disability.

**The role of the bachelor of physical therapy/physical therapist** – physical therapy begins with the application of SOAP (*Subjective, Objective, Assessment, and Plan*) and ICF (*The International Classification of Functioning, Disability and Health*) assessment models, setting up and planning goals, and evaluation and monitoring of the effectiveness of the effects of the therapy.<sup>22</sup> Physical therapy assessment (subjective and objective) is defined as:

- Anthropometric measuring (height, weight, body mass index, waist circumference, hip circumference, hip and waist circumference ratio);
- Educating the patient on heart rate and blood pressure monitoring during everyday activities;
- Measuring heart rate and blood pressure before, during, and after training;
- Telemetric electrocardiogram monitoring;
- Recognizing CV issues and comorbidities;
- Recognizing the need for further diagnostics;
- Filling out the list of problems;
- Consultation with a cardiologists and other members of the rehabilitation team;
- Adjusting physical therapy.

The physical therapist applies the appropriate cardiorespiratory and vascular therapies:



- funkcionalnog treninga koji se sastoji od aktivnosti pretežno aerobnog tipa na spravama: vožnja nožnog bicikla, ručnog bicikla, hodanje na pokretnom sagu;
- zajedno s fizijatrom individualno i grupno fizioterapeut terapijski educira pacijente te ih savjetuje o očuvanju zdravlja, razvijanju i održavanju maksimalne funkcionalne sposobnosti i pokretljivosti.

Fizioterapeut usmjeruje pozornost na individualne odgovore, podnošljivost, prisutnost znakova ili simptoma pogoršanja, što se evidentira u karton bolesnika na AKVR-u. Medicinska gimnastika i funkcionalni trening provode se u grupi koja se sastoji od najbolje 10, a najviše 14 pacijenata. Kardiorespiratorni trening nadzire se telemetrijskim praćenjem elektrokardiograma koji se obavlja uobičajeno pri prijemu, u sredini i na kraju rehabilitacije te kod promjena intenziteta opterećenja, a u indiciranim slučajevima i češće. Ako je potrebno zbog izraženih komorbiditeta ili invalidnosti aktivnosti se provode individualno.

**Uloga prvostupnika radne terapije/radnog terapeuta** – Rad prvostupnika radne terapije sastoji se od radnoterapijske (RT) procjene i liječenja.<sup>23,24</sup> Prvi i najvažniji korak jest RT procjena koja je rezultat postupka testiranja i razgovora. Svaki od postupaka zahtijeva individualni pristup pacijentu. Primjenjuju se sljedeći testovi: Kanadska mjera okupacijskog izvođenja, Upitnik upravljanja/suočavanja sa stresom, Ocjena stupnja anksioznosti i depresije HAD ljestvicom. Kroz razgovor s pacijentom potrebno je dobiti uvid unutar triju područja:

- kako bolest utječe na pacijentov život – kada se pacijentovo stanje pogoršava, koji čimbenici dovode do pogoršanja, koliko dugo promjene traju, koji se simptomi i u kojim slučajevima pojavljuju i dr.;
- koje strategije suočavanja (negativne i pozitivne) upotrebljava pacijent;
- detaljna procjena okupacijskog izvođenja (procjenjuju se područja pacijentova djelovanja: posao, odmor, slobodno vrijeme, socijalizacija, a svrha je dobiti informaciju kako pacijent sva područja kombinira). Procjena radnog terapeuta povremeno zahtijeva dodatan razgovor s članovima obitelji.

Radnoterapijski postupci uključuju edukaciju i savjetovanje koje se provodi individualno ili unutar manje grupe provedbom RT pristupa (edukacijski pristup, kompezacijski pristup, funkcionalni pristup, biomehanički pristup, kognitivno-bihevioralni pristup i model humane okupacije). Svaki je od pristupa sastavni dio AKVR-a te uključuje više čimbenika, a rezultira povećanjem funkcionalnog kapaciteta te poboljšanjem kvalitete života. Kroz savjetovanje važno je podići spremnost na život nakon rehabilitacije, a nakon toga bitna je pacijentova reintegracija u svakodnevnu aktivnost unutar svoje zajednice. Neizostavni dio savjetovanja jest i edukacija o prilagodbi stambenog i radnog prostora u kojemu pacijent boravi.

**Uloga prvostupnika sestinstva/medicinske sestre** – Rad medicinske sestre u AKVR-u odigrava se u ozračju interdisciplinarnog i transdisciplinarnog pristupa pojedinom bolesniku. On svoje korijene nalazi u temeljnome procesu zdravstvene njege koji određuje poziv medicinske sestre kao takav te uključuje aktivan odnos prema pacijentu kroz stvaranje po-

- Medical gymnastics consisting of:
  - Gradual introduction to training through easy breathing, warm up, and stretching exercises;
  - Full training – aerobic exercises/activities of targeted intensity, frequency, and duration;
  - Cooling down – gradual cessation of activity;
  - Functional training consisting of predominantly aerobic activities using exercise machines: driving a leg or arm bicycle, walking on a treadmill;
- In cooperation with the physical medicine specialist, the physical therapists educates the patients and advises them on health measures aimed at developing and maintaining maximal functional capacity and mobility.

The physical therapists focuses on individual responses and tolerance, noticing symptoms of deterioration which are noted in the patient's OCVR chart. Medical gymnastics and functional training are performed in groups of optimally ten patients, and 14 patients at most. Cardiorespiratory training is supervised using telemetric electrocardiogram monitoring that is generally performed on admission, in the middle, and the end of the program and during changes in exertion intensity, and more often in indicated cases. When necessitated by comorbidity or invalidity, training is performed on an individual basis.

**The role of the bachelor of occupational therapy/occupational therapist** – the role of the bachelor of occupational therapy consist of occupational therapy (OT) evaluation and treatment.<sup>23,24</sup> The first and most important step in OT assessment with is a result of a testing process and conversation. Every procedure requires an individual approach to each patient. The tests used are Canadian measure of occupational performance, Questionnaire on management/facing stress, and the Hospital Anxiety and Depression Scale. The occupational therapist much gain insights in three areas through conversation with the patient:

- How the disease influences the patient's life – when does the patients state deteriorate, which factors lead to deterioration, how long do the changes last, which symptoms manifest and in which cases, etc.
- Which coping strategies (negative and positive) does the patient use;
- A detailed evaluation of occupational performance (the patients areas of activity are assessed: work, rest, free time, and socialization, with the goal of forming picture of how the patient combines these areas). Assessment by a work therapist requires additional conversation with family members.

Occupational therapy procedures include education and counseling that takes place individually or in smaller groups through application of the OT approach (educational approach, compensated approach, functional approach, biomechanical approach, cognitive-behavioral approach, and human occupation model). Each of these approaches is an integral part of OCVR and includes several factors, ultimately leading to increased functional capacity and improved quality of life. It is important for counselling to increase the capacity for life after rehabilitation, after which it is important to reintegrate the patient into everyday activities in their community. An integral part of the counseling is education on adapting the home and workspace to the patient's needs..

zitivnog i motivacijskog ozračja tijekom cijeloga procesa KV rehabilitacije. Medicinska je sestra osoba koja povezuje kardiologa i pacijenta tijekom postupka rehabilitacije.

Prvostupnik sestriinstva sudjeluje u radu tima AKVR-a i nastavlja se kroz organizacijske, dijagnostičke, terapijske, opservacijske i edukacijske zadatke:

- organizacijski zadatci: upis radi mogućeg uključenja, predbilježba za termin uključenja, otvaranje potrebne medicinske dokumentacije kod prijma, dogovor termina obrade
- dijagnostički/opservacijski postupci: ako se tijekom AKVR-a pojave tegobe, medicinska sestra uzima anamnestičke podatke, mjeri i prati vitalne pokazatelje, konzultira se s kardiologom
- terapijski postupci: u slučaju pojave tegoba tijekom AKVR-a daje ordiniranu terapiju i sudjeluje u zbrinjavanju i opservaciji pacijenta do njegova premještanja u bolničku ustanovu
- edukacijski postupci: u okviru svoje stručnosti i kompetencija medicinska sestra individualno i grupno savjetuje bolesnika o važnosti rehabilitacije, potrebi za redovitim uzimanjem lijekova i pridržavanjem preporuka kardiologa, daje savjete o KV čimbenicima rizika<sup>25</sup> kroz usmene i pisane upute te sudjeluje u tjednoj edukaciji bolesnika držeći tematska predavanja i radionicu.

Medicinska sestra također se brine o dostupnosti i roku trajanja lijekova te dostupnosti i ispravnosti potrebne opreme za cijeli postupak AKVR-a.

## Izravni medicinski troškovi ambulantne kardiovaskularne rehabilitacije

U većini europskih zemalja manje od polovice pacijenata u kojih je indicirana kardiovaskularna rehabilitacija u nju je i uključena.<sup>20</sup> Malo je objavljenih literarnih podataka o troškovima programa AKVR:

- prema podacima iz Ujedinjenog Kraljevstva<sup>26</sup>, cijena izravnih medicinskih troškova programa AKVR iznosila je 5007 kn po pacijentu
- podatci iz Njemačke objavljeni 2009. godine<sup>27</sup>, gdje tradicionalno dominira stacionarna KV rehabilitacija<sup>28</sup>, utvrdili su da je cijena izravnih medicinskih troškova ambulante bila niža za 4629 kn od stacionarne KV rehabilitacije uz isti utjecaj na kvalitetu života (10 910,28 ± 2427,08 kn za ambulatnu prema 15 533,28 ± 2727,57 kn za stacionarnu po pacijentu)
- prosječni iznos ispostavljenog računa po pacijentu prema Hrvatskom zavodu za zdravstveno osiguranje za AKVR u 2014. godini za pacijenta koji vježba triput tjedno tijekom tri mjeseca uz obradu i postupke iznosi oko 3500 kn, što je ekonomski mnogo pogodnije od iznosa za stacionarnu KV rehabilitaciju (šifra DBL 08; cijena po danu liječenja 574,14 kn za 2014. godinu) pogotovo za pacijente niskog i umjerenog rizika koji gravitiraju centru ambulantne KV rehabilitacije.

## Zaključak

Ambulantna kardiovaskularna rehabilitacija dokazano je učinkovit način liječenja koje se kontinuirano nastavlja na farmakološko i invazivno kardiološko i/ili kardiokirurško liječenje akutne faze bolesti. Klinički stabilnim pacijentima

**The role of the bachelor of nursing/medical nurse** – the work of medical nurses in OCVR takes place in an atmosphere that fosters an inter- and transdisciplinary approach to each patient. This approach is rooted in the basic medical care that is the determinant of the role of the medical nurse, and as such includes an active relationship with the patient through the creation of a positive and motivational atmosphere during the whole OCVR process. The medical nurse is the person that connects the cardiologist and the patient during the rehabilitation program.

The bachelor of nursing takes part in the work of the OCVR team, performing tasks related to organization, diagnostics, treatment, monitoring, and education:

- Organizational tasks: enrollment for possible inclusion in the program, signing up for the date of program start, preparing required documentation at admission, arrangement for the diagnostic procedures
- Diagnostic/monitoring procedures: in case of problems during AKVR, the nurse takes anamnestic data, monitors vital signs, and consults with the cardiologist
- Treatment procedures: in case of problems with AKVR, the nurse administers the prescribed therapy and takes part in the care and observation of the patient until they are transferred to a hospital
- Education procedures: on topics related to their expertise and competencies, the medical nurse performs individual and group counseling sessions with patients on the importance of rehabilitation, taking medication regularly, and adhering to the cardiologists recommendations, gives advice on CV risk factors<sup>25</sup> both orally and in written form, and leads topical lectures and workshops in weakly patient education sessions.

The medical nurse is also manages the availability and expiration dates of medication and the availability and functionality of equipment necessary for the whole OCVR procedure.

## Direct Medical Expenses of Outpatient Cardiovascular Rehabilitation

In most European countries, less than half of the patients with indications for CV rehabilitation actually attend a CV rehabilitation program.<sup>20</sup> There are few publications on OCVR program expenses:

- According to data from the United Kingdom<sup>26</sup>, the direct medical expenses for OCVR programs were 5007 HRK per patient.
- Data from Germany published in 2009<sup>27</sup>, where stationary CV rehabilitation is prevalent<sup>28</sup>, shows that the direct medical expenses for outpatient CV rehabilitation was 4629 HRK lower than the cost of stationary CV rehabilitation, while both had the same influence on quality of life (10910.28 ± 2427.08 HRK per patient for outpatient programs versus 15533.28 ± 2727.57 for stationary programs).
- The average bill per OCVR patient, directed to the Croatian Health Insurance Fund, was approximately 3500 HRK for a patient that trains three times a week over three months, analysis and procedure cost included. This is significantly more economical than the cost of stationary CV rehabilitation (DBL 08; cost per day of treatment in 2014: 574.14 HRK), especially for patients at low and moderate risk that are common in OCVR.

to liječenje omogućuje aktivan život u mjestu boravka, uz skrb rehabilitacijskog tima skupine zdravstvenih djelatnika. Provodi se dugotrajno i rezultira povećanjem funkcionalnog kapaciteta, vraćanjem radne sposobnosti i poboljšanjem kvalitete života.

Ovaj je oblik kardiološkog liječenja u Hrvatskoj, kao i u drugim zemljama, prilagodljiv i ekonomski isplativ, no premalo iskorišten zbog zanemarivanja njegove važnosti od samih zdravstvenih djelatnika, ali i geografske dostupnosti rehabilitacijskih centara. Tako je već 33 godine ambulanta kardiološka rehabilitacija dostupna samo za pacijente iz Grada Zagreba i Zagrebačke županije. Stoga postoji potreba da se ambulanta kardiološka rehabilitacija organizira i u drugim hrvatskim gradovima.

## Conclusion

Outpatient cardiovascular rehabilitation has been proven to be an effective treatment to continuously apply after pharmacological and invasive and/or surgical treatment of the acute phase of the disease. This treatment allows clinically stable patients to lead active lives in their places of residence, thanks to the efforts of a rehabilitation team of medical workers. Cardiovascular rehabilitation is long-term treatment that increases functional capacity, allows the patient to be fit for work, and improves quality of life.

This form of cardiologic treatment is, in Croatia as in other countries, adaptable and economical, but underused because it is ignored by medical professionals themselves, but also due to possible remoteness of available rehabilitation centers. Outpatient cardiovascular rehabilitation has for 33 years only been available to patients residing in the city of Zagreb and Zagreb County. Therefore, there is a need to organize rehabilitation centers in other Croatian cities as well.

## LITERATURE

- Peršić V, Miletić B, Boban M, et al. Cardiovascular prevention and rehabilitation: where are we and where are we heading to? *Cardiol Croat.* 2012;7(5-6):158-69.
- The BACPR Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation 2012. <http://www.bsh.org.uk/files/download.php?m=documents&f=120424090845-GuidelineBACPR.pdf> (18. 2. 2015).
- Steinacker JM, Liu Y, Muche R, et al. Long term effects of comprehensive cardiac rehabilitation in an inpatient and outpatient setting. *Swiss Med Wkly.* 2011;140:w13141. DOI: <http://dx.doi.org/10.4414/smww.2010.13141>
- Hrvatski zavod za javno zdravstvo. Izvješće o umrlim osobama u Hrvatskoj u 2013. godini.
- JBS3 Board. Joint British Societies' consensus recommendations for the prevention of cardiovascular disease (JBS3). *Heart.* 2014;100 Suppl 2:iii-67. DOI: <http://dx.doi.org/10.1136/heartjnl-2014-305693>
- Sandesara PB, Lambert CT, Gordon NF, et al. Cardiac rehabilitation and risk reduction: time to "rebrand and reinvigorate". *J Am Coll Cardiol.* 2015;65(4):389-95. DOI: <http://dx.doi.org/10.1016/j.jacc.2014.10.059>
- Jonke V. (ur.). 60. obljetnica Poliklinike za prevenciju kardiovaskularnih bolesti i rehabilitaciju. Poliklinika za prevenciju kardiovaskularnih bolesti i rehabilitaciju, Zagreb, 2010.
- Thompson PD. Exercise-based, comprehensive cardiac rehabilitation. In: Libby P, Bonow RO, Mann DL, Zipes DP. Braunwald's heart disease: a textbook of cardiovascular medicine. 8th Ed. Philadelphia: Saunders Elsevier; 2008, pp. 1149-55.
- Majačić M. Kasna posthospitarna rehabilitacija bolesnika nakon infarkta miokarda (konceptualno-organizacijski aspekt). U: Defilipis B (ur.) Dani Zavoda 1983: 65. obljetnica Zavoda za zaštitu zdravlja grada Zagreba. Zagreb: Zavod za zaštitu zdravlja grada Zagreba; 1983, str. 331-41.
- Majačić M, Heim I, Jembrek M, Jonke V, Katalinić J, Hočevar M. Problem rehabilitacije i radne sposobnosti bolesnika nakon preboljelog infarkta miokarda u većim gradovima. Naša iskustva. U: Zbornik radova 1. jugoslavenskog kongresa o kardiovaskularnoj rehabilitaciji. Krapinske Toplice; 1988, str. 637-43.
- Jonke V, Heim I, Jembrek-Gostović M. Tjelesna aktivnost i rehabilitacija u sekundarnoj prevenciji. U: Reiner Ž (ur.). Zbornik radova sa znanstvenog skupa "Prevenција ateroskleroze – Uloga tjelesne aktivnosti". Zagreb: Hrvatska akademija znanosti i umjetnosti; 2009, str. 31-46.
- Program „10 dana do boljeg zdravlja – POKRENITE SE NA SLJEMENU U RITMU ZDRAVIH KORAKA". <http://www.srcana.hr/hr/vijesti/pregled/29/> (18.2.2015).
- Hrvatski savez slijepih. Projekti u tijeku. <http://www.savez-slijepih.hr/hr/kategorija/projekti-u-tijeku-298/> (18.2.2015).
- Krstić G, Ivanušić M, Škerk V. Prevalence of cardiovascular risk factors in the participants of the public health initiative on the occasion of the 2014 World Heart Day in Zagreb. *Cardiol Croat.* 2014;9(11-12):558-62. DOI: <http://dx.doi.org/10.15836/ccar.2014.558>
- Bibliografija. <http://www.srcana.hr/hr/sadržaj/info/bibliografija/> (18. 2. 2015).
- European Society of Cardiology. How to set up and run a cardiac rehabilitation program. <http://www.escardio.org/communities/EACPR/news/Pages/how-to-set-up-cr-program.aspx#6> (18.2.2015).
- Hammill BG, Curtis LH, Schulman KA, Whellan DJ. Relationship between cardiac rehabilitation and long-term risks of death and myocardial infarction among elderly Medicare beneficiaries. *Circulation.* 2010;121(1):63-70. DOI: <http://dx.doi.org/10.1161/CIRCULATIONAHA.109.876383>
- Pavy B, Barbet R, Carré F, et al.; Working Group of Exercise Rehabilitation and Sport. Therapeutic Education Commission of the French Society of Cardiology. Therapeutic education in coronary heart disease: position paper from the Working Group of Exercise Rehabilitation and Sport (GERS) and the Therapeutic Education Commission of the French Society of Cardiology. *Arch Cardiovasc Dis.* 2013;106(12):680-9. DOI: <http://dx.doi.org/10.1016/j.acvd.2013.10.002>
- Romčević M. Out-patient cardiac rehabilitation is efficient in elderly people. *Cardiol Croat.* 2010;5(7):88-90.
- Bjarnason-Wehrens B, McGee H, Zwisler AD, et al.; Cardiac Rehabilitation Section European Association of Cardiovascular Prevention and Rehabilitation. Cardiac rehabilitation in Europe: results from the European Cardiac Rehabilitation Inventory Survey. *Eur J Cardiovasc Prev Rehabil.* 2010;17(4):410-8. DOI: <http://dx.doi.org/10.1097/HJR.0b013e328334f42d>
- Whalley B, Thompson DR, Taylor RS. Psychological interventions for coronary heart disease: cochrane systematic review and meta-analysis. *Int J Behav Med.* 2014;21(1):109-21. DOI: <http://dx.doi.org/10.1007/s12529-012-9282-x>
- Hrvatska komora fizioterapeuta. Izrada plana i programa u fizikalnoj terapiji. <http://www.hkf.hr/Portals/0/Datoteka/Plan%20i%20program%20fizikalne%20terapije.pdf> (18.2.2015).
- Štefanac Š. Occupational therapy with people affected by cardiovascular disease. *Cardiol Croat.* 2011;6(11):303-8.
- Matthews MM, Foderaro D, O'Leary S. Cardiac dysfunction. In: Pedretti LW, editor. Occupational therapy: practice skills physical dysfunction. 4th Ed. St. Louis: Mosby; 1996, pp. 693-709.
- Eshah NF, Bond AE. Cardiac rehabilitation programme for coronary heart disease patients: an integrative literature review. *Int J Nurs Pract.* 2009;15(3):131-9. DOI: <http://dx.doi.org/10.1111/j.1440-172X.2009.01738.x>
- Making the case for cardiac rehabilitation: modelling potential impact on readmissions. January 2013. [http://www.natcatsat.nhs.uk/dlhandler.ashx?d=pubs&f=Case\\_for\\_CR.pdf](http://www.natcatsat.nhs.uk/dlhandler.ashx?d=pubs&f=Case_for_CR.pdf) (18.2.2015).
- Benzer W. Development and importance of outpatient cardiac rehabilitation in German-speaking countries. *Dtsch Med Wochenschr.* 2014;139(27):1427-32. DOI: <http://dx.doi.org/10.1055/s-0034-1370127>
- Schweikert B, Hahmann H, Steinacker JM, et al. Intervention study shows outpatient cardiac rehabilitation to be economically at least as attractive as inpatient rehabilitation. *Clin Res Cardiol.* 2009;98(12):787-95. DOI: <http://dx.doi.org/10.1007/s00392-009-0081-6>