

From Cardiac Rehabilitation to Ambulatory Preventive Care: The Swiss Way

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Abstract

Over the last years, cardiac rehabilitation services have expanded their indication to include not just patients after myocardial infarction or surgery, but also a variety of non-acute cardiovascular disease (CVD) states like stable coronary artery disease, peripheral artery disease, neurovascular disease as well as asymptomatic patients with no history of CVD but with a constellation of cardiovascular risk factors, especially metabolic syndrome and diabetes mellitus. In 2015, 110 ambulatory cardiovascular prevention and rehabilitation programs existed in Switzerland: 57 for cardiac, 17 for peripheral artery disease and 36 for diabetes rehabilitation.

Rehabilitative and preventive care is provided by a team of professionals including preventive cardiologists, exercise experts (physiotherapists and sports scientists), nurses, dieticians, psychologists, occupational therapists and social services experts. It seems reasonable to combine professional efforts by integrating prevention and rehabilitation for all high risk patients. The creation of cardiovascular prevention centers, which bring together professionals and patients in dedicated hospital or community settings is a promising first step. In 2015, 7 centers have been recognized as specialized cardiovascular prevention centers in Switzerland.

Furthermore, community-based and patient-centered activities and programs have a great potential to contribute to improved preventive care and to support long-term adherence. A closer cooperation between professional preventive teams in prevention centers and the primary care physicians has a great potential to contribute to close this gap and to provide seamless primary and secondary preventive care for patients in need and the society.

Keywords:

Cardiac rehabilitation, secondary prevention, cardiovascular risk factors, exercise training, prevention center, primary care physician

Zusammenfassung

Über die letzten Jahre hat sich die Indikation zur kardialen Rehabilitation erweitert und beschränkt sich nicht nur auf Patienten nach Myokardinfarkt und/oder Herzoperationen. Sie schliesst auch verschiedene nicht-akute vaskuläre Erkrankungen ein wie stabile koronare Herzkrankheit, peripher-arterielle Verschlusskrankheit, neurovaskuläre Erkrankungen, aber auch asymptomatische Patienten mit hohem kardiovaskulärem Risiko, und dabei vor allem Patienten mit metabolischem Syndrom und Diabetes mellitus. Im Jahr 2015 gab es in der Schweiz 57 ambulante Präventions- und Rehabilitationsprogramme für Herzpatienten, 17 für Patienten mit peripher-arterieller Verschlusskrankheit und 36 Programme für Patienten mit Diabetes mellitus.

Die rehabilitativen und präventiven Interventionen werden von einem umfassenden multidisziplinären Team angeboten, zu denen folgende Berufsgruppen gehören: In der Prävention und Rehabilitation geschulte Ärzte, Bewegungstherapeuten (Physiotherapeuten und Sportwissenschaftler), Ernährungsberatung, Psychologen und Sozialberatung. Zur Nutzung von Synergien, zur Stärkung der Kompetenz und zur Stärkung des Präventionsgedankens nach innen und nach aussen ist es sinnvoll, die präventiven Kompetenzen in einem Präventionszentrum zusammenzufassen. Im Jahr 2015 gab es in der Schweiz 7 solche Präventionszentren, Tendenz steigend.

Patienten-zentrierte und im Lebensraum der Betroffenen basierte Aktivitäten und Programme haben ein grosses Potenzial, die Therapie-Erfolge der Rehabilitations- und Präventionsprogramme nachhaltig zu sichern. Dabei ist eine optimale Zusammenarbeit der Präventionszentren mit den Grundversorgern von zentraler Bedeutung. Das Konzept für eine solche Zusammenarbeit wird in der Schweiz derzeit erarbeitet.

Schlüsselwörter:

Kardiale Rehabilitation, sekundäre Prävention, kardiovaskuläre Risikofaktoren, Training und körperliche Aktivität, Präventionszentrum, Hausarzt

Introduction

Traditionally, cardiac rehabilitation (CR) services aim to restore the physical, psychological, and vocational status of cardiac patients [1–5]. In recent times, the main focus has moved from the restoration of a patient's health following an acute event towards a more pronounced long-term targeted secondary prevention intervention.

As a consequence, CR services have expanded their indication to include not just patients after myocardial infarction or surgery, but also a variety of non-acute vascular disease (CVD) states like stable coronary artery disease, peripheral artery disease, neurovascular disease as well as asymptomatic patients with no history of CVD but with a constellation of cardiovascular risk factors, especially metabolic syndrome and diabetes mellitus [6–8].

Rehabilitative and preventive care is provided by a team of professionals including preventive cardiologists, exercise experts (physiotherapists and sports scientists), nurses, dieticians, psychologists, occupational therapists and social services experts. Primary and secondary prevention of CVD both require specialist knowledge and a wide range of professional skills in order to provide successful evidence-based preventive and rehabilitative care. Because primary and secondary prevention have common approaches in terms of lifestyle and risk factor intervention and some drug treatments, and are founded on strong evidence base, it seems reasonable to combine professional efforts by integrating prevention and rehabilitation for all high risk patients. The creation of cardiovascular prevention centers, which bring together professionals and patients in dedicated hospital or community settings is a promising first step.

However, caregivers need to be aware that lifestyle changes and adherence to medication are often difficult. Lifestyle is usually based on long-standing patterns and is highly determined by someone's social environment and socioeconomic status. Reasons for poor adherence to medication and lifestyle recommendations are multifactorial and complex. Increased awareness of these factors by caregivers is important. Furthermore, community-based and patient-centered activities and programs have a great potential to contribute to improved preventive care and to support long-term adherence.

Primary care physicians are a critical professional group for the successful implementation of primary and secondary CVD prevention. They deliver more than 90% of consultations and provide the vast majority of preventive care. However, a significant gap remains between physicians' knowledge and attitudes and the actual practice of preventive cardiology. A closer cooperation between professional preventive teams in prevention centers and the primary care physicians has a great potential to contribute to close this gap and to provide seamless primary and secondary preventive care for patients in need and the society.

This article describes the Swiss way from traditional cardiac rehabilitation to a modern concept of integrated preventive care with important key competences in primary care and supported by multidisciplinary professional teams in outpatient clinics.

From cardiac rehabilitation to secondary prevention

Structured cardiac rehabilitation goes back to the late 60s also in Switzerland and was, at the beginning, given only in rehabilitation clinics. In 1972, the first *ambulatory rehabilitation programs* have been available for patients in Zürich and Bern, mainly based on group-wise performed exercise therapy. In 1986, the first comprehensive multidisciplinary cardiac rehabilitation program has started in Olten. In 1985, the Swiss Working Group for Cardiac Rehabilitation (SAKR) has been founded. As a first step, an inventory of existing cardiac rehabilitation programs has been established including 21 stationary and 21 ambulatory cardiac rehabilitation programs at this time [1–5]. In 1992, quality criteria for cardiac rehabilitation have been formulated which resulted in a steady decrease of stationary rehabilitation centers and a continuous increase of ambulatory programs. As of today, Switzerland has 11 stationary cardiac rehabilitation clinics and 57 ambulatory cardiovascular rehabilitation and prevention programs. Stationary cardiac rehabilitation is considered for unstable, more frail and mostly elderly patients in need of more intense supervision and treatment, whereas ambulatory centers evolved more and more into comprehensive cardiovascular prevention and rehabilitation programs.

In 1998, a first step from only cardiac to cardiovascular rehabilitation has been made at the Inselspital Bern by including a peripheral artery disease (PAD) rehabilitation program but with a special emphasis on walking exercises. Minimal standards and quality criteria have been established during the following years. The *PAD rehabilitation program* structure has been accepted by the Federal Health Department BAG in the year 2009 with the consequence that program costs are covered by health insurance. The number of PAD rehabilitation programs is slowly growing to a current number of 17 programs throughout Switzerland. There is a trend to integrate PAD patients at least partially into the cardiac rehabilitation programs, as most of the program components are similar and can be provided in common [6].

In 2003, the first ambulatory *diabetes rehabilitation program* has been established at the Inselspital Bern, again based on the structure of the multidisciplinary ambulatory cardiac and the PAD rehabilitation programs. Target patients are patients with early stages of type 2 diabetes being in need of a comprehensive risk factor and lifestyle intervention program [7]. Minimal standards and quality criteria have been established. Since 2010, the diabetes rehabilitation program is also recognized by the Federal Office of Public Health (BAG) and costs are covered by health insurance. Today, there are 36 ambulatory diabetes rehabilitation programs, all of them connected with a diabetologist and/or a specialized diabetes care center. Many of these programs are also linked to ambulatory obesity intervention programs.

In 2006, the first ambulatory *neurovascular rehabilitation program* has been established at the Inselspital Bern. Patients with transient ischemic attacks or minor strokes without need for a specific neurological rehabilitation program are included and attend a similar program structure as in the other prevention and rehabilitation programs including lifestyle and risk factor interventions but also specific components targeting at specific psychological needs and treating minor neuromotor deficits. First results are encouraging and it is planned to submit the program to the BAG, asking for its recognition and reimbursement [8].

With the development of all these ambulatory prevention and rehabilitation programs it became evident that lifestyle and risk factors are the main topics for all programs and that a major part of education and counselling but also some of the exercise sessions could be provided in common by using synergies leading to an important economy of effort (Fig. 1).

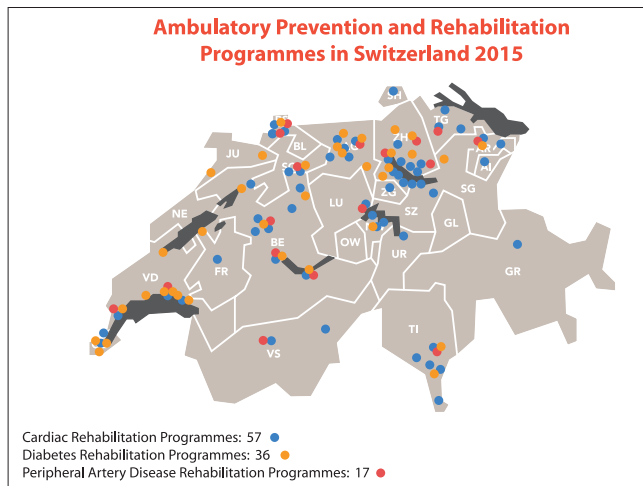


Figure 1: Ambulatory prevention and rehabilitation programs in Switzerland for patients with cardiac disease, peripheral artery disease and diabetes (November 2015).

Exercise is Medicine

Physical exercise is the cornerstone and the main evidence-based intervention in secondary prevention programs.

Over the last decades, scientific evidence has accumulated proving the role of physical activity and exercise in the prevention and treatment of cardiovascular disease beyond any reasonable doubt [9–11]. Few treatment strategies in medicine have been evaluated so rigorously in large patient groups as regular physical exercise. Exercise training has been shown to have direct benefits on the heart and coronary vasculature, including endothelial function, autonomic tone, coagulation and clotting factors and inflammatory markers, the development of coronary collateral vessels and the mobilization of endothelial progenitor cells [12]. Physical activity also helps to treat many established atherosclerotic risk factors, including elevated blood pressure, insulin resistance and glucose intolerance, elevated triglyceride concentration, low high-density lipoprotein cholesterol concentrations, and obesity. Exercise in combination with weight reduction can decrease low-density lipoprotein cholesterol concentrations and limit the reduction in HDL-cholesterol that often occurs with a reduction in dietary saturated fat [13]. Reduction in mortality may also be mediated through improvements in risk factors for atherosclerotic disease. Therefore, physical activity and exercise training are promoted in most government health initiatives for primary and secondary prevention of cardiovascular disease and have become a cornerstone in secondary prevention programs [14]. Physical activity is a class IB recommendation for primary prevention and exercise training is a class IA recommendation for all eligible patients with ACS, for patients immediately post-CABP or post-PCI, for patients with peripheral artery disease and a class IB recommendation for patients with stable chronic angina in most national and international guidelines. Physical

activity is also considered as a main component of neurovascular, diabetes and pulmonary rehabilitation programs. Indications for exercise training are rapidly expanding to many other diseases such as cancer, rheumatologic diseases and mental disorders.

In order to provide exercise therapy appropriately, the first training courses for cardiac rehabilitation therapists have been organized in Switzerland in the year 1992. In the year 2002, a formal postgraduate training in cardiovascular exercise therapy was established by the Cardiovascular Prevention and Rehabilitation Unit at the Inselspital Bern in cooperation with the Swiss Sports School in Magglingen for physiotherapists and sports teachers. In the year 2006, a formal postgraduate teaching program for exercise and sports therapy in internal medicine has been established at the University of Berne in close cooperation between the faculty of Medicine and the Philosophy-History Faculty (Institute for Sports Sciences) at the University of Bern. Since then, postgraduate training courses are offered for cardiac, PAD and diabetes rehabilitation with the opportunity to qualify for the diploma of advanced sciences DAS in cardiovascular and diabetes therapy (Swiss Cardiovascular Therapist). During the last few years, additional teaching programs have been established for oncology patients and for patients with orthopedic diseases.

Multidisciplinary care: call for prevention centers

The provision of preventive cardiology services require an integrated professional multidisciplinary approach. This must include cardiologists, other medical specialists, nurses and allied health professionals, and general practitioners, all with appropriate professional training and experience. Uniting these professionals in one center is both an efficient and effective way of delivering comprehensive prevention and rehabilitation services (Fig. 2). So, the European Association for Cardiovascular Prevention and Rehabilitation is calling for the creation of modern cardiovascular prevention centers across Europe [15]. The term “cardiovascular prevention center” is generic and may take different forms in different health settings but with common principles: 1. Leadership in prevention and rehabilitation, 2. Excellence in preventive and

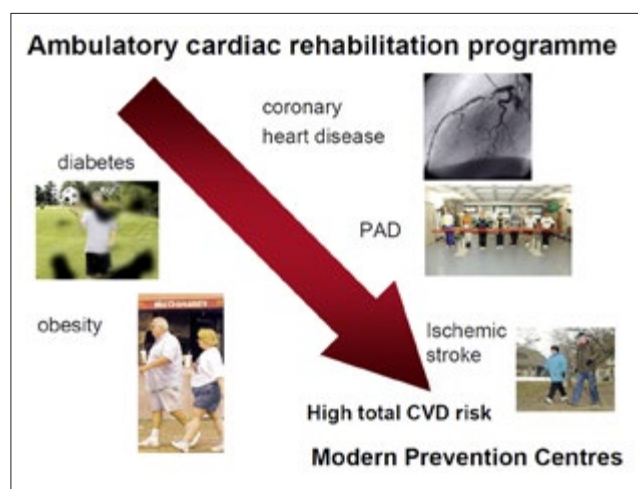


Figure 2: The transition from traditional ambulatory cardiac rehabilitation programs into comprehensive prevention centers [14].

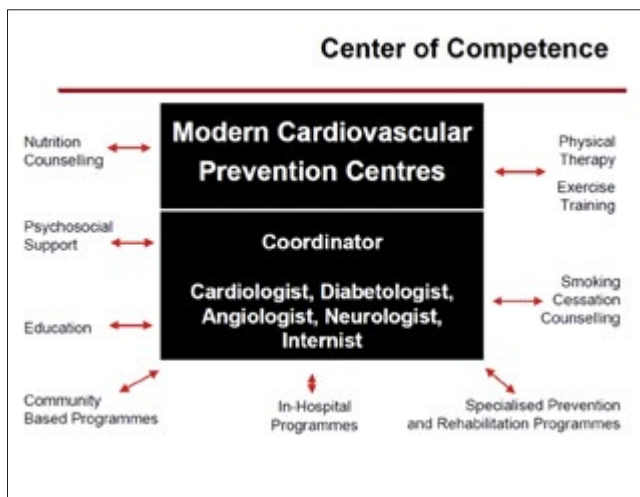


Figure 3: A modern cardiovascular prevention center [14].

rehabilitative care for all high risk patients, 3. Evaluation of lifestyle, risk factors and other outcomes at end of program and over the long term, 4. Research into the clinical and cost-effectiveness of innovative models of service delivery in prevention and rehabilitation (including eHealth and Telemedicine), and 5. Teaching and training health professionals in all aspects of prevention and rehabilitation (*Fig. 3*).

In Switzerland, the first cardiovascular prevention center has been established at the Kantonsspital Olten. In the year 2014, quality criteria for cardiovascular centers in Switzerland have been established in close cooperation with the Swiss Cardiology Society, the Swiss Angiology Society, the Swiss Society for Endocrinology and Diabetes and the Swiss Cardiovascular Therapists. A network for Swiss cardiovascular prevention centers has been established.

The role of the primary care physician

Primary care physicians have a pivotal role in the successful implementation of primary and secondary prevention guidelines for both population and high-risk approaches to reduce the burden of CVD [16,17]. Increasingly, in this area of health cost containment, the primary care physician is recognized as: 1. the main and sometimes the only source of healthcare for a large number of individuals, 2. an affordable physician, and 3. the gatekeeper for referral to medical specialists. Although the majority of primary care physicians intuitively support the concept of preventive cardiology and generally have a high level of knowledge of cardiovascular risk factors, a significant gap remains between physician knowledge and attitudes and the actual practice of preventive cardiology. Despite the enormous burden of CVD, many patients at high risk remain undiagnosed and untreated. General practitioners perform a unique role in CVD prevention by identifying individuals at risk of developing CVD and assessing their eligibility for interventions including prevention and rehabilitation programs.

Seamless primary and secondary preventive care

Optimal cooperation between primary care physicians, cardiologist working in primary care and structured preventive

services such as prevention centers is crucial for successful implementation of seamless care for persons at high-risk and for patients with CVD. Primary care physicians have also an important role in supporting community based long-term maintenance programs. Currently, there are more than 140 heart patient groups and 36 diabetes patient groups across Switzerland, usually meeting once a week for common physical activities and occasional information and discussion session with doctors and allied health professionals. The supervision of these groups is often in the hands of primary care physicians with a certification based on a special training course. As of today, 760 primary care physicians and internists have been certified for this task, which is still as a voluntary engagement without reimbursement. It has to be recognized that in times of restricted resources such engagements cannot be provided any longer without adequate reimbursement and specific professional skills. The Swiss cardiovascular prevention centers are ready and willing to provide teaching and training for primary care physicians and other health professionals in all aspects of prevention and rehabilitation and to support their efforts to improve prevention at all levels of care.

Practical implications

- Cardiac rehabilitation has evolved to include prevention and to target chronic diseases and patients with multiple risk factors.
- Exercise is a key component in cardiovascular prevention and requires adequately trained personnel with specific knowledge of different pathology types.
- There is a strong rationale to develop prevention centers within hospitals so that the knowledge of all specialists and allied health professionals can be coordinated in an interdisciplinary way.
- Lifestyle changes will have a positive effect on risk and morbidity through close collaboration between centers and primary care practitioners, and with patient-centered ecologically adapted interventions.

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The author declares no conflicts of interest, aside the fact that most of the described projects have been initiated and developed by him. He declares in particular no financial conflict and that he has not received any monetary compensation linked to this work.

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References

1. Piffner D, Saner H. Aktuelle Situation der kardialen Rehabilitation in der Schweiz. *Schweiz.med.Wschr.* 1990;120:1565–1568. →

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2. Saner H, Saner B, Stäubli R. Erste Erfahrungen mit einem komprehensiven ambulanten Rehabilitationsprogramm für Herzpatienten. *Schweiz. med. Wschr.* 1994;124:2075–2082.
 3. Saner H, Pfiffner D. Ambulante Rehabilitation von Herzpatienten in der Schweiz. *Wien Klein Wochenschr* 1995;107/24:771–773.
 4. Saner H. Ambulante kardiale Rehabilitation in der Schweiz. *Deutsche Zeitschrift für Sportmedizin* 2002;53(5):130–134.
 5. Saner H. Der Schweizer Weg der kardiologischen Rehabilitation. *Herz* 2012;37:38–43.
 6. Schumacher A, Gretener S, Saner H. Gehtraining als suffiziente Therapiemethode bei Patienten mit peripherer arterieller Verschlusskrankheit (PAVK). *Schweiz Med Forum* 2012;12(3):30–31.
 7. Puder J, Grimm JJ, Hagon-Traub I, Ruiz J, Saner H. DIAfit, ein Schweizer Programm zur Förderung der körperlichen Aktivität bei Patienten mit Diabetes mellitus. *Schweiz Med Forum* 2011;11(27):478–480.
 8. Kamm Ch., Schmid JP, Müri R, Mattle H, Eser P, Saner H. Interdisciplinary Cardiovascular and Neurologic Outpatient Rehabilitation in Patients Surviving Transient ischemic Attack or stroke With Minor or No Residual Deficits. *Archives of Phys Med and Rehab* 2014;95:656–662.
 9. Shiroma EJ, Lee IM. Physical activity and cardiovascular health: Lessons learned from epidemiological studies across age, gender, and race/ethnicity. *Circulation* 2010;122:743–725.
 10. Lee DC, Artero EG, Sui X. Mortality trends in the general population: The importance of cardiorespiratory fitness. *J Psychopharmacol* 2010; 24:27–35.
 11. Myers J, Prakash, Froelicher V. Exercise capacity and mortality among men referred for exercise testing. *N Engl J Med* 2002;346:793–801.
 12. Gielen S, Schuler G, Adams V. Cardiovascular effects of exercise training: molecular mechanism. *Circulation* 2010;122:1221–1238.
 13. Tall AR. Exercise to reduce cardiovascular risk – how much is enough? *N Engl J Med* 2002;347:1522–1524.
 14. Gielen St, Mezzani A, Pontremoli P, Binno S, Villani GQ, Piepoli M, Niebauer J, Forman D. Physical activity and inactivity. In *The ESC Textbook of Preventive Cardiology*, Oxford University Press, Oxford; 2015, p140–174.
 15. Saner H and Wood D. Practical organization of preventive cardiology programmes: integrating prevention and rehabilitation. *Europ J of Cardiovasc Prev and Rehab* 2009; 16 (Suppl 2):S37–S42.
 16. Knapton M. Long-term cardiovascular conditions: The role of primary care. *British J of General Practice* 2011;659–660.
 17. Schmid JP and Saner H. Ambulatory preventive care: outpatient clinics and primary care. In *The ESC Textbook of Preventive Cardiology*, Oxford University Press, Oxford 2015, p 294–302.