

# Coronary Heart Disease and Return to Work

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# Coronary Heart Disease and Return to Work

Angelique de Rijk

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## Abstract

After a cardiac event, up to 80% of the employees return to work within one year. Cardiac rehabilitation (CR), which focuses on the physical, psychological, and social functioning, contributes to faster return to work (RTW). Specific attention for work-related issues might improve the RTW rate. Three systematic reviews were done on: (1) risk factors in the workplace for cardiac patients; (2) factors that prolonged sickness absence in cardiac patients; and (3) the effectiveness of RTW interventions for cardiac patients. Existing guidelines, expert knowledge of representatives of 11 different health professions, and a working group of psychologists were additionally used to select risk factors and management to

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promote RTW in cardiac patients as part of CR. The reviews, guidelines, and expert knowledge identified four groups of risk factors for RTW: eight cardiac risk factors; four psychosocial job-related risk factors; six physical risk factors; and 17 psychosocial risk factors (barriers to a successful RTW). Positive effects of interventions were found for the more comprehensive interventions. Key recommendations based on scientific evidence and expert advice are targeting via a short intake that eliminates those patients that do not need RTW support; early start of (part-time) RTW during CR; tailor-made RTW support based on individual risk assessment and interventions within and outside CR that address the individual risks; and frequent communication between the CR team and the workplace (occupational physician), upon patient agreement.

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**Keywords**

Cardiovascular disease · Coronary heart disease · Return to work · Cardiac rehabilitation · Risk factors · Assessment · Intervention · Tailoring

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**Introduction**

Generally, 80% of employees who have been admitted at a hospital for myocardial infarction (MI), coronary artery bypass graft surgery (CABG) (“bypass”), or percutaneous coronary intervention (PCI, an intervention to treat the stenotic coronary arteries) have returned to work after one year (Perk and Alexanderson 2004; Worcester et al. 2014). This rate seems rather stable over the years and populations, but there is room for improvement. Return to work (RTW) can take place faster and become more effective when the RTW support is given earlier (Jelinek 2014) and when the RTW support takes into account patient-specific risk factors (Smedegaard et al. 2017; Reibis et al. 2019).

RTW support can be offered as part of cardiac rehabilitation (CR). CR is delivered in hospitals, in rehabilitation centers, or at local physiotherapists combined with telemonitoring at home (Kraal et al. 2017). It is offered to patients after their stay in the hospital for an acute cardiac condition such as MI, CABG, and PCI. In recent years, it is also offered to patients with more chronic conditions such as heart failure (reduced pumping function of the heart). CR has four goals: (1) physical recovery, (2) psychological recovery, (3) social recovery, and (4) lifestyle improvement. CR improves functional capacity, recovery, and psychological well-being and is cost-effective (Piepoli et al. 2010). Effectiveness lies in CR improving the physical condition, lifestyle (e.g., smoking cessation), medication adherence, and psychological well-being (Piepoli et al. 2010). The latter is of utmost importance since 75% of cardiac patients have elevated levels of depressive symptoms and/or symptoms of anxiety. About one fifth of cardiac patients suffer from depressive disorder (De Jong et al. 2004; Thombs et al. 2006). These conditions reduce the patient’s health status in itself but are also risk factors for recurrent cardiovascular morbidity (disease) and mortality, and, finally, they reduce compliance with medical and lifestyle

interventions. CR will thus indirectly contribute to RTW by improving physical condition, lifestyle, and psychological well-being.

CR that focuses on physical recovery has been offered to patients since the 1960s. This exercise-based CR is proven effective in reducing total and cardiovascular mortality and hospital admissions (Jolliffe et al. 2001; Piepoli et al. 2010; Heran et al. 2011). Next, CR has been extended with lifestyle interventions: quitting smoking, active lifestyle, no or moderate alcohol consumption, weight reduction, and healthy diet (reduction in saturated and trans fat, improve the consumption of n-3 fatty acids, improve consumption of fruit and vegetables, and reduce salt consumption). Often, psychological approaches are used to change unhealthy behavior into healthy behavior (Piepoli et al. 2010). CR is well implemented in the Western world although intensity varies (Piepoli et al. 2010).

However, specific attention to work-related issues or RTW is often lacking within CR (Reibis et al. 2019). In some countries, specialized occupational physicians or insurance physicians are available to support patients during their sickness absence and RTW. Only in recent years, specific interventions have been developed, but initially with little success. In their review of studies between 1982 and 2000, Perk and Alexanderson (2004) found no effects of specific RTW interventions for patients after MI, PCI, and CABG. An important aspect that was lacking in these interventions is tailoring to the specific needs of the employee with coronary heart disease, for example, reducing work demands (O'Hagan et al. 2012; Reibis et al. 2019). (Occupational) health professionals need to be aware of the possible patient-specific risk factors for delayed RTW and be able to decide on the individual patient's risk factors and on interventions to decrease or eliminate the patient's risk factors.

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## Outline of This Chapter

This chapter aims to familiarize the reader with the specific risk factors for RTW and possible interventions to improve the RTW of employees with coronary heart disease. This knowledge is not only important for research but also for (medical) practice, as most guidelines and directions for cardiac patients do not yet address the work situation or RTW support (cf Piepoli et al. 2016) or only offer broad directions (Reibis et al. 2019). This chapter will therefore address three topics:

1. Factors that impede RTW in employees with coronary heart disease (cardiac risk factors, psychosocial and physical work-related risk factors, and barriers to a successful RTW)
2. Interventions for employees with coronary heart disease that improve their RTW
3. Recommendations by experts for the organization of support of RTW of employees with coronary heart disease including tools (within CR)

Topics 1 and 2 are addressed via systematic reviews of the literature, except for cardiac risk factors and physical work-related risk factors, for which several guidelines already exist (see below). The searches were conducted in the context

**Table 1** Search strategies and quality assessment of reviews

Stage	Review topic		
	1. Psychosocial work-related risk factors	2. Barriers to a successful RTW	3. Interventions for employees with coronary heart disease that improve RTW
# hits review 2010	1220	130	664
# relevant on the basis of the title 2010	419	86	300
# relevant on the basis of the abstract 2010	380	67	216
# full articles available 2010	291	63	180
(# added on basis of references 2010)	39	14	4
# met inclusion criteria on basis of full article 2010	32	21	14
# hits review 2018	152		
# added on basis of relevance of title, abstract and full article 2018	3	14	3
<b>Total number of articles</b>	<b>35</b>	<b>35</b>	<b>17</b>
Quality of studies	<i>N</i> = 35: fair	<i>N</i> = 35: fair	<i>N</i> = 13: fair

of developing a multidisciplinary guideline for CR in the Netherlands during 2008–2011 (van Stipdonk et al. 2011) and done during autumn 2010 for publications in the previous 10 years (and thus not overlapping those in Perk and Alexanderson 2004) in the following databases: PsycINFO, CINAHL, and PubMed. The findings of these searches for the guideline were supplemented by a recent search of literature on RTW in patients with cardiovascular disease (2010–September 2018). The quality of individual studies was assessed (high quality, randomized controlled trial; fair quality, non-randomized trial, cohort study, and patient-control study; low quality, study with major flaws). The search strategy and quality assessment are presented in Table 1.

The conclusions of the reviews will be supplemented by three very recent reviews and recommendations on aspects of RTW of cardiac patients (Gragnano et al. 2018; O'Brien et al. 2018; Reibis et al. 2019). Moreover, the reviews will be supplemented by expert knowledge generated in the context of the guideline development described above. Experts were representatives of 12 scientific societies of professions involved in CR in the Netherlands (cardiologists, psychiatrists, psychologists, rehabilitation physicians, cardiac nurses, occupational therapists, physiotherapists, social workers, occupational physicians, occupational experts, social insurance physicians, and general practitioners). Also, representatives of the cardiac patient's association were involved. The discussions with experts covered 11 meetings over a period of 18 months and resulted in recommendations. In addition to these experts, a temporary working group of nine psychologists advised on psychological

screening instruments and cutoff points to be used within CR. Thus, first risk factors for the recurrence of a cardiac event and barriers to RTW in employees with coronary heart disease will be addressed, and next evidence for RTW interventions for patients with coronary heart disease and, finally, a RTW support procedure within CR including practical tools will be presented. This chapter will be finished with conclusions for research and practice.

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## **Risk Factors for Recurrence of a Cardiac Event and Barriers for RTW in Employees with Coronary Heart Disease**

When addressing RTW in employees with coronary heart disease, it is important to distinguish between preventing a recurrent cardiac event (through managing cardiac, psychosocial, and physical work-related risk factors) and removing barriers for RTW (by managing risk factors for impaired RTW).

### **Cardiac Risk Factors**

International and national guidelines (Bjarnason-Wehrens et al. 2004; van Dijk et al. 2006; Piepoli et al. 2010; Reibis et al. 2019) and the experts referred to above agree on eight cardiac factors that might affect work ability and/or increase the chance for recurrence of the cardiac event, possibly in interaction with certain working conditions (see Table 2). Table 2 also presents norms for when a factor is assumed to be a risk factor. First, (1) residual ischemia and (2) reduced heart function (left ventricular ejection factor <40%) are indications that working under heavy circumstances is dangerous. Next, (3) medication for the patient with coronary heart disease might have side effects that interfere with functioning at work. For example,  $\beta$ -blockers reduce physical endurance and hamper performing heavy physical jobs. Stress at work can provoke (4) arrhythmia (irregular heart rate) and (5) tachycardia (too rapid heart rate), which the treating cardiologist might judge as being harmful, depending on the specific medical condition and level of stress at work. When untreated or resistant to treatment, (6) hypertension is regarded harmful above 160/100 mmHg and an extra risk for the respective patient for recurrence of a cardiac event. When the work situation demands (7) higher physical endurance than the patients has, this is again a risk for recurrence. Low physical endurance is also a risk for delayed RTW, as two recent studies showed (Salzwedel et al. 2016; Boschetto et al. 2016).

Existence of these cardiac risk factors does not imply that RTW will not be possible. However, they need to be interpreted in relation to the type of work. In practice, occupational health expertise is needed to weigh up the cardiac risk factors in relation to the exposure at work and to formulate recommendations for work adaptations or alternative work (van Dijk et al. 2006) as there is still no agreement on norms (Reibis et al. 2019).

**Table 2** Cardiac risk factors that might interfere with performing work

Cardiac risk factors	Explanation including norms	References
1. Residual ischemia	Four classes of severity are distinguished by the New York Heart Association (NYHA classes) related to chest pain when climbing stairs (no pain = class I; pain after 3 stairs of 15 steps = class II; pain after 1 stair of 15 steps = class III) or even in rest (class IV) Precise exercise capacity and ischemic threshold can be established by bicycle ergometry or treadmill maximal stress test →Working conditions might provoke ischemia	Bjarnason-Wehrens et al. 2004; van Dijk et al. 2006; Piepoli et al. 2010; Boschetto et al. 2016; Salzwedel et al. 2016; Reibis et al. 2019
2. Reduced heart function (left ventricular ejection factor <40%).	→If reduced, the patient cannot perform physically heavy work	
3. Medication (particularly $\beta$ -blockers)	→Side effects might interfere with working conditions (e.g., $\beta$ -blockers reduce physical endurance)	
4. Arrhythmias (atrial or ventricular)	→ Stress or physical work demands might provoke arrhythmias	
5. Ventricular tachycardia (with strain and stress)	→ Stress might provoke ventricular tachycardia	
6. Untreated/therapy-resistant hypertension ( $\geq 160/100$ mmHg)	Treatment is recommended for hypertension $\geq 140/90$ mmHg, but some patients have low treatment adherence or their hypertension is resistant to therapy → Employees need to have a blood pressure <140/90 mmHg during rest	
7. Low physical endurance tolerance (determined by an endurance test)	Precise exercise capacity and ischemic threshold can be established by bicycle ergometry or treadmill maximal stress test →Working conditions should be below the patient's physical endurance	
8. ICD/PM implant	→ ICD/PM implant might interfere with electromagnetic exposure in the workplace	

## Work-Related Risk Factors: Psychosocial Risk Factors

There is firm scientific evidence for the relationship between psychosocial work characteristics and coronary heart disease. Primarily, research regarding recurrence of coronary heart disease is relevant for defining risk factors for lack of RTW, but – as there is little research on work-related risk factors for impeded RTW – also research regarding the work-related etiology of coronary heart diseases is regarded informative (see Table 3).

Stressors at work are risk factors for RTW in persons with coronary heart disease, as they may increase the chance for recurrent cardiac events. There is moderate evidence regarding job demands and job strain (combination of high demands and low autonomy) in relation to recurrent cardiac incidence. Only for men there is enough evidence that high work demands are a strong prognostic risk factor for a recurrent cardiac event, particularly when combined with low autonomy at work. Recent research of Biering et al. (2015) demonstrated more sickness absence after PCI (percutaneous coronary intervention; see above) when having high demands and low autonomy, however, not an increased risk for cardiac events after RTW – which might be explained by changes in perceived or actual working conditions. Söderberg et al. (2015) showed that acute coronary syndrome (e.g., MI) survivors, who worked under adverse psychosocial work conditions, had lower return-to-work expectations compared to those working under better psychosocial work conditions. Salzwedel et al. (2016), however, found a higher psychosocial workload to *increase* the probability of RTW. Again, the results were primarily found among men, which could result from few female study participants or gender differences in RTW mechanisms. Gragnano et al. (2018), who reviewed work-related predictors for

**Table 3** Psychosocial risk factors for (recurrent) cardiac event

Psychosocial risk factors for . . .	References
1. High work demands (in combination with low autonomy) for recurrent cardiac event	Belkic et al. 2004; Eaker et al. 2004; Malinauskiene et al. 2004; Riese et al. 2004; De Bacquer et al. 2005; Kivimäki et al. 2006; Kornitzer et al. 2006; Peter et al. 2006; Lallukka et al. 2006; Nomura et al. 2007; Wang et al. 2007; Eller et al. 2009; Bonde et al. 2009
2. High effort-reward imbalance for first cardiac event	Peter et al. 2002; Ala-Mursula et al. 2005; Chandola et al. 2005; van Vegchel et al. 2005; Peter et al. 2006
3. Lack of support from colleagues/supervisor for first cardiac event	Belkic et al. 2004; De Bacquer et al. 2005; Kuper et al. 2006; André-Petersson et al. 2007; Chandola et al. 2008; Eller et al. 2009
4. Other stressors at work for first cardiac event: financial setbacks, bankruptcy, not realizing a promotion, increase or decrease of responsibility, conflict, too many deadlines, too much competition at work, too much criticism of supervisor, change of workplace, and job dissatisfaction	Falger and Schouten 1992; Ferrie et al. 1995, 1998, 2002; Kivimäki et al. 2003; Theorell et al. 2003; Virtanen et al. 2003; Lee et al. 2004; Vahtera et al. 2004; Müller-Nordhorn et al. 2003; Gallo et al. 2006; Huisman et al. 2008; Väänänen et al. 2008; Eller et al. 2009; Fiabane et al. 2013



RTW in patients with cardiovascular disease published between 1994 and 2016, concluded that job strain and job control were the most important predictors of RTW, in addition to work ability.

A high effort-reward imbalance also increases the risk for a first cardiac event.

Recent research by Biering et al. (2015) among PCI patients showed that high work pace, low commitment to the workplace, low recognition (rewards), and low job control were associated with sickness absence at three months, but not after one year.

As Table 3 shows, lack of support from colleagues/supervisor is a risk factor for first cardiac events. There is evidence that other stressors at work also increase the risk for (first) cardiac events. Finally, and also shown in Table 3, there is suggestive evidence that diverse other stressors at work increase the risk for a first cardiac event.

### Work-Related Risk Factors: Physical Risk Factors

For physical risk factors, guidelines already exist and no new review has been performed. These guidelines agree on four physical working environment factors that increase the risk for a cardiac event (Table 4). There is strong evidence for exposure to chemical and physical hazards and to noise. Shift work has direct negative effects on cardiovascular disease but also via a bad lifestyle. The evidence for sedentary work is weak, and often inconclusive, as studies often do not control for active lifestyle, groups are selective, and measures for sedentary work might not be valid. Findings are inconclusive for the following factors. Physically heavy work (e.g., lifting) is only regarded dangerous when performed irregularly by employees with a bad physical endurance. It is recommended that during an 8-hour working day, physical demands do not exceed 30–40% of VO<sub>2</sub> maximal (Wiedeman et al. 1984). For working under extreme temperatures, which might trigger cardiac events, findings are contradictory and, according to the guideline, up to the discretion of occupational physicians (van Dijk et al. 2006).

**Table 4** Physical risk factors in the working environment for cardiac events

Physical risk factor	References
1. Chemical and physical hazards, e.g., passive smoking, carbon monoxide, small particles ( $\leq 2.5 \mu\text{m}$ )	Allred et al. 1989, He et al. 1999; Peters et al. 2001; Whincup et al. 2004
2. Noise ( $\geq 85$ dB)	Babisch et al. 2005; Willich et al. 1993
3. Shift work	Schnall et al. 2000; Knutsson 2003;
4. Sedentary work without compensating active lifestyle	van Uffelen et al. 2010
5. Physically heavy work	Wiedeman et al. 1984
6. Working under extreme temperatures	van Dijk et al. 2006; van Stipdonk et al. 2011

## Barriers to a Successful RTW

Many factors prolong sickness absence in cardiac patients. Four areas of psychosocial barriers to RTW can be distinguished: (1) vulnerable social-demographic status; (2) health problems and unhealthy lifestyle; (3) mental health problems; and (4) negative perceptions. In total, 17 barriers to a successful RTW are identified (see Table 5). A recent review that includes studies on factors related to RTW in cardiovascular disease published between 1994 and 2016 parallels these findings (Gragnano et al. 2018).

*Social-demographic factors.* As Table 5 shows, cardiac patients with low education and/or low social support in their environment have increased risk not to return

**Table 5** Barriers to a successful RTW

Risk factor for RTW after cardiac event	References
<i>Social-demographic factors</i>	
1. Low education	Soejima et al. 1999; Söderman et al. 2003; Earle et al. 2006; Smedegaard et al. 2017; Butt et al. 2018
2. Low social support in their environment	Soejima et al. 1999; Sykes et al. 2000;
3. Female gender	Kragholm et al. 2015; Dreyer et al. 2016; Smedegaard et al. 2017; Butt et al. 2018;
4. >50 years of age	Kragholm et al. 2015; Butt et al. 2018
<i>Health problems and unhealthy lifestyle</i>	
5. Persistence of angina symptoms after hospitalization	Froom et al. 1999; Clarke et al. 2000; Shrey and Mital 2000; Mittag et al. 2001; Kamphuis et al. 2002; Earle et al. 2006; Samkange-Zeeb et al. 2006;
6. Cardiac health limits daily functioning	
7. Experience reduced physical activity on a daily basis	Sykes et al. 2000; Mittag et al. 2001; Slebus et al. 2007
8. Excessive alcohol use	
9. Prior cardiovascular disease symptoms	Froom et al. 1999; Clarke et al. 2000; Shrey and Mital 2000; Mittag et al. 2001; Kamphuis et al. 2002; Earle et al. 2006; Samkange-Zeeb et al. 2006; Butt et al. 2018
10. Other health problems	
<i>Mental health problems</i>	
11. Depressive symptoms	O'Neil et al. 2010; Ervasti et al. 2015; Haschke et al. 2012; de Jonge et al. 2014; Smedegaard et al. 2017
12. Anxiety symptoms	Gragnano et al. 2018; Reibis et al. 2019
<i>Negative perceptions</i>	
13. Lack of acceptance of the illness	Clarke et al. 2000; Müller-Nordhorn et al. 2003; Earle et al. 2006; Hemingway et al. 2007; Bergvik et al. 2012; Fiabane et al. 2013; Söderberg et al. 2015
14. Low recovery expectations	
15. Lack of self-confidence	
16. Low internal locus of control	
17. Lack of job satisfaction or motivation for RTW	

**Table 6** Norm scores for depression and anxiety in patients with coronary heart disease

	Depression	Anxiety
<b>First choice</b>	<i>Patient Health Questionnaire 9 items (PHQ-9)</i> (Spitzer et al. 1999) Severe: 10–27 Moderate: 5–9 Low: 0–4	<i>Generalized Anxiety Disorder 7 items (GAD-7)</i> (Spitzer et al. 2006) Severe: 10–27 Moderate: 5–9 Low: 0–4
<b>Second choice</b>	<i>Beck Depression Inventory (BDI)</i> (Beck et al. 1996) Severe: 10–63 Moderate: 5–9 Low: 0–4	<i>Beck Anxiety Inventory (BAI)</i> (Beck et al. 1988) Severe: 10–63 Moderate: 5–9 Low: 0–4
<b>Third choice</b>	<i>Hospital Anxiety and Depressions Scale – Depression (HADS-D)</i> (Spinhoven et al. 1997) Severe: 8–21 Moderate: 5–7 Low: 0–4	<i>Hospital Anxiety and Depressions Scale – Anxiety (HADS-A)</i> (Spinhoven et al. 1997) Severe: 8–21 Moderate: 5–7 Low: 0–4

to their work. Several recent studies showed that women return to work less than men and, also, older cardiac patients return to work less often than younger patients.

*Health problems and unhealthy lifestyle.* If patients experience symptoms of angina after hospital dismissal and/or limitations in daily functioning, this hampers their RTW (see Table 5). Unhealthy lifestyle in terms of low physical activity and high alcohol consumption also hamper RTW. Patients with a history of cardiovascular disease are also hampered, as are those who have other health problems. Recently, Butt et al. (2018) found absence of major comorbidities to be associated with return to work 1 year after discharge for CABG.

*Mental health problems.* Depressive symptoms decrease the RTW chance considerably (the literature on anxiety is scarce but also points toward an increased risk for less RTW). Levels of depression and anxiety can be measured via assessment instruments (questionnaires). In the context of the guideline development, a systematic review and meeting with a specific working group of psychologists was organized to establish the top 3 of best assessment instruments (leaving discretion to the hospitals) with corresponding norm scores (van Engen-Verheul et al. 2012) (Table 6). Severe levels of depression and/or anxiety are an indication for a diagnostic interview to judge whether the patient fulfills the criteria for a depressive disorder or anxiety disorder or not. Low levels, though, indicate the absence of a risk factor. The HADS is widely accepted in hospitals, but psychometric qualities are low, particularly for anxiety, even though Reibis et al. (2019) recommend the HADS to assess psychosocial parameters to improve RTW after an acute coronary syndrome such as MI.

*Negative perceptions.* As Table 5 shows, lack of acceptance of the illness, low recovery expectations, lack of self-confidence, and lower internal locus of control and motivation for RTW are all related to lower RTW rates. These negative thoughts that function as barriers to RTW might be explained by depression and/or might be

rooted in adverse psychosocial working conditions. Söderberg et al. (2015) demonstrated in a cross-sectional study that such conditions are related to lower RTW expectations via fear-avoidance beliefs toward the workplace.

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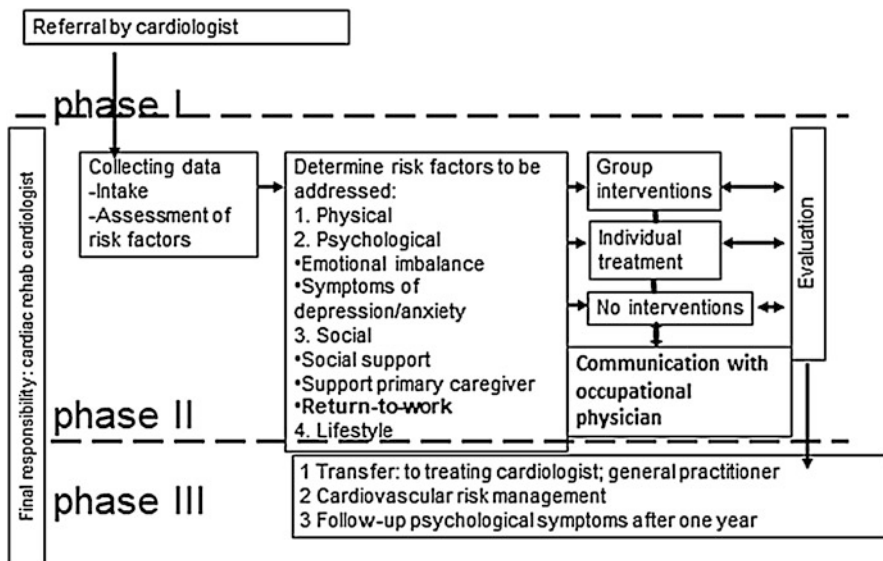
## **RTW Interventions for Employees with Coronary Heart Disease**

Thirteen studies on RTW interventions for cardiac patients that met the inclusion criteria (published between January 2000 and September 2018; listed in PsycINFO, CINAHL, PubMed; evaluation study of RTW intervention in patients with a coronary heart disease) are included. Positive effects of interventions are found for ten of the interventions (Mital et al. 2000; Varvaro 1991; Higgins et al. 2001; Kutzleb and Reiner 2006; Hanssen et al. 2007; Broadbent et al. 2009; McKee 2009; Lamberti et al. 2016; Babić et al. 2015; Pirhonen et al. 2017). Generally, they are more comprehensive than the three interventions that did not yield results (Pfund 2001; Hanssen et al. 2009; Yonezawa et al. 2009). Still, the effective interventions vary largely regarding content. They include interventions focusing on reduction of barriers in terms of lifestyle, physical condition, and psychological symptoms by health education strategies; making a return-to-work plan; occupational counselling; establishing work modifications; and extensive assessment of the patient's condition in order to advise on when to return to work. Lamberti et al. (2016) and Babić et al. (2015) demonstrate that lack or delayed CR was related to reduced RTW. In checking the references of the hits, another four studies of fair quality were found that had been published before 2000 but had not been included in the review of Perk and Alexanderson (2004) (Picard et al. 1989; Haussler and Keck 1997; Dumont et al. 1999; Johnston et al. 1999). These studies present extensive and effective interventions. For example, one German intervention included a guided trajectory consisting of making up a problem analysis and a reintegration plan during rehabilitation; next a meeting with the employer regarding work modifications; and finally administrative and psychological support to safeguard RTW (Haussler and Keck 1997). The recent study by Pirhonen et al. (2017) showed positive effects of person-centered care on increased self-efficacy, but the positive effects on RTW were nonsignificant due to too short follow-up. Their intervention consists of patients and clinicians identifying and discussing problems and next considering both the outcomes of clinical tests and the practical, social, and emotional effects of their condition(s) and treatment(s) on their daily lives. A shared decision-making process informs a plan of action. O'Brien et al. (2018) showed with a meta-analysis of 18 RTW interventions for MI patients, a 3-month increase in RTW rate compared to usual care.

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## **Recommendations by Experts for the Support of RTW in CR**

On the basis of the scientific literature and expert opinion, a RTW support procedure within CR is recommended (Fig. 1). Basically, this procedure aligns with the support strategies that Reibis et al. (2019) recommend after CR.



**Fig. 1** RTW support procedure within CR

In essence, the RTW support procedure needs to be tailored to the cardiac patient's individual risk factors and should be comprehensive enough to tackle risk factors for CVD and barriers to RTW. Further, the experts, with the occupational physicians in particular, advocate for gradual RTW during CR, so CR patients are supported by the CR team and have plenty of opportunities to discuss work-related problems. Indeed, system delays decrease RTW (Laut et al. 2014). Reibis et al. (2019) also emphasize part-time, stepwise reintegration into work. However, they envision that RTW support is part of prolonged CR, rather than an integral part of CR. Because prolonged CR hardly exists across different countries (Reibis et al. 2019), it is recommended though to incorporate RTW support within regular CR.

The RTW support procedure should start with referral of the patient to CR by the treating cardiologist. To target the RTW support and align with other services, first, whether the patient has a work-related problem and is in need of RTW support needs to be checked and, if so, the risk factors from Tables 2, 3, 4, and 5 be assessed (the CR-WORK checklist with questions to support targeting during the intake for CR is available with the author upon request). In line with this, Reibis et al. (2019) also recommend risk stratification and making up a work-related diagnosis.

This assessment requires a trained nurse or reintegration professional. On the basis of risks for hampered RTW, interventions within and outside the CR/hospital setting need to be selected and be prioritized together with the patient (the CR matrix with RTW interventions and referral options within and outside the hospital is available with the author upon request). In line with privacy laws, it is of utmost importance that healthcare workers do not contact the employer directly but communicate via the occupational physician and patient. This is to avoid (1) that

employers receive medical, and thus private, information and (2) bypassing a possible occupational physician who – if available in a country’s system – has a key role in translating medical status into work opportunities. Further and in line with the law on exchange of medical information, patients need to agree with the cardiologist on sending medical information to his or her occupational physician (if available). Lack of clarity regarding legislation and roles might lead to a reserved attitude regarding RTW support of cardiac patients.

During the support procedure, all CR professionals should monitor the patient’s (steps toward) gradual RTW and the bottlenecks experienced by (in)formal talks with the patient, discuss the monitoring results in interdisciplinary meetings, and take adequate action if needed. Finally, the intervention results need to be evaluated. Within a CR setting, this is after 2–3 months. If the results are satisfying for the patient and professionals, the patient is transferred to guidance by the treating physician.

As part of the guideline project, we did a pilot study on using the CR-WORK checklist in one hospital during 2 weeks. Generally, the healthcare workers acknowledged two types of patients: those who feel pressed by the return to their work and those who hesitated to return to work and searched for ways to legitimize the delay of their RTW. The healthcare workers preferred a checklist format that fits their work routines. Also, the healthcare workers needed more knowledge about interventions to manage the risk factors and a standardized “tick-box format” letter to communicate with the patients’ occupational physician.

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## Conclusions

There is evidence that specific support for RTW within CR improves the RTW rate, but interventions vary widely and are not integrated well in CR nor address the various types of risks. In this chapter, it is proposed to target the cardiac patients in need of RTW support, to screen them for risk factors, and to select interventions that fit with the individual risk factors, which are delivered both within and outside CR.

The review results have led to a guideline for RTW within CR in the Netherlands (van Stipdonk et al. 2011) and have implications for CR in other countries. In many countries, occupational physicians are not available or do not have tasks regarding RTW guidance. Even though in the Netherlands, occupational physicians have a key role in RTW guidance, they are not available to an increasing number of patients at working age (e.g., the self-employed, those working for temporary agencies, etc.). Bridging hospital treatment (rehabilitation) with workplace requirements is thus a bottleneck in all countries. CR is of utmost importance to support cardiac patients in their RTW (Piepoli et al. 2010; Reibis et al. 2019). It can be concluded that RTW guidance should be part of CR in order not to delay RTW unnecessarily and offer the patient tailor-made support. Standardized checklists such as the CR-WORK checklist, valid psychological questionnaires, and the CR matrix with RTW interventions offer healthcare workers more grip on an important aspect of CR that they might be insecure about. Reintegration agencies outside hospitals can also use the information

in this chapter to develop their interventions. Next, the effectiveness of the new checklist and the intervention recommendations need to be studied in studies of high quality.

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## Cross-References

- ▶ [An Integrative Framework for Return to Work After Common Mental Disorders](#)
- ▶ [Employment as a Key Rehabilitation Outcome](#)
- ▶ [Implementing Best Practice Models of Return to Work](#)
- ▶ [Investing in Medical and Vocational Rehabilitation Services](#)
- ▶ [Legal Aspects of Access/Return to Work](#)
- ▶ [Mental Disabilities](#)
- ▶ [Occupational Determinants of Cardiovascular Disorders Including Stroke](#)
- ▶ [Promoting Workplace Mental Wellbeing](#)
- ▶ [Socio-Environmental and Psychological Barriers to Employment](#)
- ▶ [The Impact of Working Conditions on Health Among People with and without Disability](#)

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