Disease oriented work ability assessment in social insurance medicine
Slebus, F.G.

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Factors associated with return to work after admission for acute coronary syndrome: the patient's perspective

Slebus FG, Jorstad HT, Peters RJ, Kuijer PP, Willems JH, Sluiter JK, Frings-Dresen MH.
(submitted for publication)
Abstract

Aims: To describe the time perspective of returning to work and the factors that facilitate and hinder returning to work in a group of survivors of acute coronary syndrome (ACS) and explore differences in STEMI (ST segment elevation myocardial infarction) versus NSTEMI/UA (Non ST segment elevation myocardial infarction or Unstable Angina).

Methods: Retrospective semi-structured telephone survey two to three years after hospitalisation with 84 employed Dutch ACS-patients from one academic medical hospital.

Results: Forty-nine (58%) patients returned to work within three months, whereas 74 patients (88%) at least returned once within two years after the event. Two years after hospitalisation, 30 patients (36%) were not working at their pre-ACS levels. NSTEMI/UA patients returned to work 2.7 months sooner than STEMI patients. For all ACS-patients, the most mentioned categories of facilitating factors to return to work were no illness perception and not having signs or symptoms of heart disease. Physical incapacity, co-morbidity, and mental incapacity were the top three categories of hindering factors.

Conclusion: Within two years, 10 (12%) patients had not returned to work once, and 20 (24%) were not working at pre-ACS levels. Disease factors, functional factors, environmental factors, and personal factors were listed as affecting subjects' work ability level. NSTEMI/UA patients returned to work 2.7 months sooner than STEMI patients.

In the daily practice doctors must know and must be keen on those factors they can influence to achieve return to work.
**Introduction**

Evidence-based care for patients with Acute Coronary Syndrome (ACS) is aimed at the reduction of mortality, morbidity, and early rehabilitation. Acute care\(^1,2\) for ACS patients has improved in the last decade\(^3\). Between 1999 and 2006, the in-hospital death rate for ST-segment elevation myocardial infarction (STEMI) decreased from 8.4% to 4.6%, and the in-hospital heart failure for STEMI decreased from 19.5% to 11.0%\(^3\).

Many patients who develop ACS are of working age\(^4\) and will, consequently, be sick-listed during hospitalisation. After being discharged from the hospital, returning to work is an important issue. This is not only because of the potential loss of income, but also because returning to work is thought to be associated with subjective well-being and life satisfaction\(^5,6\). Furthermore, from a societal perspective, returning to work is important because of predicted labour shortages in the near future\(^7\).

Much like chronic diseases, such as cancer\(^8\) and rheumatoid arthritis\(^9\), work participation in ACS patients has become a topic of interest for researchers\(^10,11,12\). Promoting the return to work in the follow-up care of ACS patients will promote health because returning to work encourages the patient to be active in their daily life. In a recent study by Bhattacharyya et al., it was shown that the mean time for return to work was three months. Furthermore, 80% of ACS patients in their study returned to work within 12 months, 64% of whom returned full time\(^10\). These data show that returning to work can be expected after hospitalisation; however, it is unclear when ACS patients return to work after hospitalisation and whether their return to work is long-lasting. Although clinicians might think patients with Non ST-segment elevation myocardial infarction or Unstable Angina (NSTEMI/UA) return to work sooner than ST-segment elevation myocardial infarction (STEMI) patients because the long-term mortality in STEMI patients is higher\(^13\), this appeared not to be the case\(^10\).

Participation in work is influenced by many factors, as outlined in the International Classification of Functioning, Disability and Health (ICF) model of the WHO\(^13\). In this model, the ability to work is the result of interacting factors of the disease, mental and physical functions, activities, and environmental and personal factors, which are predictable at the time of hospitalisation. These include age\(^15,16,17,18,19\), illness perception\(^20\), heart failure\(^16,18\), physical complaints\(^21\), doctor’s advice\(^11\), depressed mood\(^10\), anxiety\(^16\), co-morbidity\(^18\), financial situation\(^16\), and work demands\(^16,18,21\). These factors, however, do not indicate how returning to work can be achieved, because they are determined early in the process of returning to work\(^22\), and because returning to work part-time or at the pre-ACS level is
time-dependent\textsuperscript{10}, these factors most likely do not predict the timing of the return to work or the working hours that can be achieved. In this respect, it is interesting to know if there is a difference in factors between STEMI and NSTEMI/UA patients.

The discussion of the return to work with ACS patients has, however, not yet been fully incorporated into clinical practice\textsuperscript{11}, and the barriers that ACS patients may encounter when attempting to return to work have not been explored. Knowledge of those issues might facilitate the return to work process, as well as communication with patients. To elucidate the perspectives of ACS patients that are associated with returning to work, we formulated the following research questions:

(i) What percentage of ACS patients return to work part-time or to pre-ACS levels, and what is the time frame of their return after discharge from the hospital?

(ii) What factors do ACS patients perceive as facilitating or hindering their return to work in the short- and long-term after discharge from the hospital?

For both questions, differences between STEMI and NSTEMI/UA were explored.

**Methods**

To answer the two research questions, a retrospective telephone survey was performed with ACS patients who were admitted to the Academic Medical Center (AMC) in Amsterdam, The Netherlands. The survey was performed between November 2007 and February 2008.

**Sampling of participants**

Admission records of the Cardiac Care Unit (CCU) were used to recruit patients for the survey. Patients listed consecutively and living in the Amsterdam area were selected. The patient’s name, address, age, gender, heart disease history, possible interventions during hospitalisation, and co-morbidity were recorded from individual discharge letters. Inclusion criteria were: (1) age on admission between 18 and 63 years old, (2) admission between the first of October 2004 and the first of April 2006, and (3) diagnosed with ACS. Acute coronary syndrome was assumed when the discharge diagnosis was STEMI, NSTEMI, UA, or ACS.

All patients who had given permission for contact at discharge and were still alive
according to the Dutch register of Births, Deaths, and Marriages were contacted. Patients who were engaged in paid employment before they developed ACS, regardless of the number of working hours per week, were selected for the telephone survey.

**The survey**

A verbal questionnaire was developed and used during the interviews by the first author (FS), who is an experienced interviewer. The survey consisted of the following items: (1) the nature of the work patients performed before and after admission for ACS, (2) the date of return to work, (3) the number of working hours before and after ACS, and (4) the factors perceived as facilitating or hindering their return to work.

**Analysis**

Data of the survey were entered in SPSS 16.0. The demographics were calculated, as were the percentages of partial and full return to work for three, six, nine and 24 months after discharge from the CCU. The number of months after patients first started work, independent of working hours, was reproduced in a Kaplan-Meier curve. The equality of the survival distribution of STEMI and NSTEMI/UA patients was tested with the Log Rank test ($p < 0.05$).

The ICF model was used to categorize the facilitating and hindering factors influencing patients’ return to work in both the short-term (three months) and the long-term (24 months) after hospital discharge. Discussion took place between authors regarding the categorization of the factors identified by the patients. First, the authors captured the mentioned reasons in categorisation terms, and, thereafter, the terms were categorized using the ICF model. Discussion took place until authors could agree with the categorisation term and ICF category in which a given reason should be categorized.

**Results**

A total of 234 patients were identified on the admission records of the CCU. After checking the register of Births, Deaths, and Marriages, 15 patients were found to be deceased. Of the remaining 219 patients, 132 (60%) were contacted by telephone within the study period. Patients were called a minimum of seven times on different days and at different times before being classified as non-responders. Of those who could be reached, 84 (63%) had engaged in paid work before hospital admission for ACS and were, therefore, eligible for the study. The mean age of the 84 participants was 55 years (range
Factors associated with return to work after admission for acute coronary syndrome.

26-64, S.D. eight years), and 75 (89%) were male. Twenty patients (24%) had a history of previous cardiac events. The discharge diagnosis was STEMI in 51 patients (63%) and NSTEMI/UA in 30 patients (37%). Three discharge letters were not clear enough to distinct the difference between STEMI and NSTEMI/UA. Sixty-nine patients (82%) underwent a percutaneous coronary intervention (PCI) during the initial hospitalisation.

Return to work

Forty-nine patients (58%) returned to work within three months. By six months, 54 (80%) patients had returned to work. These numbers increased to 71 (85%) at nine months and 74 (88%) at 24 months. The percentage of patients who returned to work, regardless of working hours, are illustrated in a Kaplan-Meier curve (Fig. 1).

![Graph showing return to work over time](image)

**Figure 1** Proportion of employed ACS patients (n=84) and number of months before the patients returned to work after discharge from the hospital.

RTW: return to work.
Even within a few days after discharge from the hospital, some patients returned to their pre-ACS work. The majority returned to work within nine months after discharge. NSTEMI/UA patients returned to work 2.7 months sooner than STEMI patients (p=0.02).

**Returning to pre-ACS working hours**

At three, six, nine, and 24 months, 21 (25%), 37 (46%), 45 (56%), and 54 (64%) patients, respectively, had returned to work with their full pre-ACS working hours. Of the 30 patients (36%) who did not return to pre-ACS working hours 24 months after discharge from the hospital, 10 patients (12%) did not return to work at all.

**Factors facilitating the return to work**

The facilitating factors associated with returning to work within three months are presented in Table 1. In the first column, the answer categories are given, and examples of answers are given in the second column. Not having complaints of heart disease and feeling good were the most commonly mentioned reasons for returning to work.

<table>
<thead>
<tr>
<th>Categorisation terms (number of times categorised)</th>
<th>Examples of facilitating reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs or symptoms of disease (19)</td>
<td>“No heart complaints anymore”</td>
</tr>
<tr>
<td>Illness perception (17)</td>
<td>“Felt good”</td>
</tr>
<tr>
<td></td>
<td>“Nothing did hurt”</td>
</tr>
<tr>
<td>Work content (2)</td>
<td>“Work adjustment”</td>
</tr>
<tr>
<td>Relationships at work (1)</td>
<td>“Nice fellow workers”</td>
</tr>
<tr>
<td>The ability to participate (1)</td>
<td>“Was able to do everything”</td>
</tr>
<tr>
<td>Functioning of medical care (1)</td>
<td>“The information given by the doctor”</td>
</tr>
<tr>
<td>Treatment because of disease (1)</td>
<td>“Good treatment”</td>
</tr>
<tr>
<td>Family relationships (1)</td>
<td>“The stress at home diminished”</td>
</tr>
<tr>
<td>Financial situation (1)</td>
<td>“Could not afford not working”</td>
</tr>
<tr>
<td>Motivation (1)</td>
<td>“Was motivated”</td>
</tr>
</tbody>
</table>
within three months. Information regarding the return to work given by doctors was mentioned once. Factors within the work environment, such as supportive colleagues, were also mentioned once.

**Hindering factors for returning to work**

The factors hindering the return to work within three months of being discharged from the hospital are presented in Table 2. Table 3 presents the factors hindering a return to work or a return to pre-ACS working levels within 24 months of being discharged from the hospital. In the first column, the answer categories are given. The second column contains examples of answers. We found that a wide diversity of hindering factors were given for not returning to work.

### Table 2

Factors (n=77) hindering the return to work, independent of working hours, within three months after hospital discharge in order of frequency of reasons given, reported by the total group of 84 patients.

<table>
<thead>
<tr>
<th>Factor categories (number of times mentioned)</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical capacity (19)</td>
<td>&quot;Tiredness&quot;</td>
</tr>
<tr>
<td>Co-morbidity (13)</td>
<td>&quot;Diabetes&quot; &quot;Low back pain&quot;</td>
</tr>
<tr>
<td>Mental capacity (8)</td>
<td>&quot;Concentration problems&quot;</td>
</tr>
<tr>
<td>Terms of employment (6)</td>
<td>&quot;Was sacked after returning to work&quot;</td>
</tr>
<tr>
<td>Motivation (5)</td>
<td>&quot;Was not enthusiastic to work anymore&quot;</td>
</tr>
<tr>
<td>Side effects of medication (5)</td>
<td>&quot;Dizziness because of medication&quot;</td>
</tr>
<tr>
<td>Social security (5)</td>
<td>&quot;The rules made it possible to retire&quot;</td>
</tr>
<tr>
<td>Signs or symptoms of disease (5)</td>
<td>&quot;Still heart complaints&quot;</td>
</tr>
<tr>
<td>Treatment because of disease (5)</td>
<td>&quot;Rehabilitation program&quot; &quot;Waiting for PCI&quot;</td>
</tr>
<tr>
<td>Work content (2)</td>
<td>&quot;Too high physical work demands&quot; &quot;Too high psychological work demands&quot;</td>
</tr>
<tr>
<td>Relationships at work (2)</td>
<td>&quot;Problems with the boss&quot;</td>
</tr>
<tr>
<td>Self confidence (1)</td>
<td>&quot;Felt insecure when working&quot;</td>
</tr>
<tr>
<td>Course of disease (1)</td>
<td>&quot;Was frequently ill&quot;</td>
</tr>
</tbody>
</table>
Table 2 shows that physical and mental incapacity, the existence of co-morbidities, unfavourable terms of employment, and motivational problems were frequently mentioned reasons that hindered the return to work after discharge. Age was mentioned once as a hindering reason.

Physical capacity, co-morbidity, terms of employment, and social security were the most frequently cited categories for not working or not returning at pre-ACS working hours (Table 3).

### Table 3

Reasons (n=55) given for not restarting or not returning to the previous job full time 24 months after discharge from the hospital. The data are based on 30 patients and are presented in the order of response frequency.

<table>
<thead>
<tr>
<th>Response category (number of times given)</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical capacity (8)</td>
<td>“Was too tired”</td>
</tr>
<tr>
<td>Co-morbidity (8)</td>
<td>“Carcinoma” “Hernia”</td>
</tr>
<tr>
<td>Terms of employment (7)</td>
<td>“Was sacked”</td>
</tr>
<tr>
<td>Social security (7)</td>
<td>“It was possible to retire”</td>
</tr>
<tr>
<td>Course of disease (6)</td>
<td>“Was again hospitalized”</td>
</tr>
<tr>
<td>Condition of the heart (4)</td>
<td>“20% pump stroke”</td>
</tr>
<tr>
<td>Motivation (3)</td>
<td>“Did not want to work anymore”</td>
</tr>
<tr>
<td>Signs or symptoms of disease (3)</td>
<td>“Too tired because of heart disease”</td>
</tr>
<tr>
<td>Work content (2)</td>
<td>“Too high work demands”</td>
</tr>
<tr>
<td>The ability to participate (2)</td>
<td>“Was sacked because of dis-functioning”</td>
</tr>
<tr>
<td>Mental capacity (1)</td>
<td>“Concentration problems”</td>
</tr>
<tr>
<td>Side effects of medication (1)</td>
<td>“Could not stand the medication”</td>
</tr>
<tr>
<td>Needed capacity in work (1)</td>
<td>“Problems with walking”</td>
</tr>
<tr>
<td>Age (1)</td>
<td>“Was too old”</td>
</tr>
<tr>
<td>Self confidence (1)</td>
<td>“Felt insecure when working”</td>
</tr>
</tbody>
</table>

**ICF categories of facilitating or hindering factors.**

The percentage of factors facilitating the return to work within three months divided among the ICF categories are illustrated in Figure 2. The factors hindering the return
Factors associated with return to work after admission for acute coronary syndrome.

As can be observed the figure 2, we were on average unable to categorise the factors as participation or activity problems.

Hindering reasons to return to work (n=41) at pre-ACS levels within 24 months after discharge of STEMI patients could be categorised 10 times (23%) as a disease factor, 11 times 27% as a function and structure factor and 14 times (34%) as an environmental factor. These figures of hindering reasons (n=12) were for NSTEMI/UA patients 9 (75%), 1 (8%), and 2 (17%) respectively.
Discussion

Forty-nine patients (58%) in this study had returned to work within three months of being discharged from the hospital. Two years after hospitalisation, 74 patients (88%) had returned to work, but 20 patients (24%) were unable to work at their pre-ACS levels 24 months after discharge. Restarting work, therefore, does not automatically imply that pre-ACS working hours are achieved.

Reasons categorised as illness perception and not having signs or symptoms of cardiac disease were by far the most mentioned facilitating factors to return to work within three months. Reasons categorised as decreased physical capacity, the existence of co-morbidity, less mental capacity, unfavourable terms of employment, less motivation and were categories of factors that frequently hindered the return to work.

NSTEMI/UA patients returned to work 2.7 months sooner than STEMI patients. Hindering factors for returning to work at pre-ACS working levels of STEMI compared to NSTEMI/UA patients could be categorized less as disease factors and more as functional and environmental factors.

A strong point of our study compared to other studies is our focus on the patients’ perspective for returning to work and their ability to return to work at pre-ACS levels. We found that 36% of the patients did not return at all or returned to work at less than their pre-ACS working hours. These values are nearly twice as high as those reported by Bhattacharyya et al. The focus on the limited pre-ACS working levels may explain the differences found in our study.

Recall bias cannot be ruled out in our study, but it should not be prominent since an ACS is a major life event that should be marked in time and vividly present in one’s memory. Furthermore, answers that classify patients as vulnerable, for example, “was not enthusiastic anymore to work,” imply that patients have reflected on the factors associated with the return to work, making a recall bias less likely.

Contrary to prognostic studies on the return to work after heart events, our study shows factors that matter in the perspective of patients when the patients actually return to work, and with that, the meaning of prognostic factors for the return to work are given. For instance, age is a known prognostic factor that was only mentioned once in our study. This can be explained by the fact that older age is associated with early retirement or unemployment, factors that were mentioned more often in our study. Another example might be depression, which was rarely mentioned in our study,
but which is a known prognostic factor\textsuperscript{10}. A lack of motivation was, however, mentioned five times and can be a symptom of depression.

Knowing the perspective of ACS patients in return to work matters might facilitate communication with patients but also gives opportunities to stimulate return to work. Even if the patient is not motivated, doctors can give advice to return to work.

The existence of co-morbidity has not been cited in many studies as a prognostic factor for ACS patients to return to work\textsuperscript{22}, but in our study and in other diseases, such as lower back pain\textsuperscript{23}, co-morbidity is an important issue. Because ACS is a major life event, there is a chance that co-morbidity will be overlooked in the follow-up. In discussing return to work, therefore, special attention should be paid to possible co-morbidities.

Categorising the facilitating and hindering factors according to the ICF model showed that the activity and participation categories could not be scored as being in opposition with the other categories. This implies that ACS patients do not define the ability to participate in work in terms of activities that can no longer be performed or in participation problems they encounter, but in terms of their disease, their capacities, the environment in which they live, and the person that they are. When discussing the ability to return to work, multiple issues can, therefore, be expected. In this discussion this study showed, although based on small numbers, that it can be anticipated that STEMI patients return to work later and report less disease factors, like co-morbidities, but they report more function factors, like physical incapacity and environmental factors. This pattern indicates problems in the fit between the work that has to be performed and the work that can be performed.

Terms of employment and social security are embedded in social arrangements, and it seems that they fall outside the domain of the cardiologist. Discussing return to work in an early phase of the recovery process, however, might motivate patients to do so. This study shows that returning to work is an issue for ACS patients, both in the short- and long-term following discharge from the hospital. Moreover, in gaining the patient’s perspective, different factors can influence this process and its eventual outcome. Those different factors fall within the realms of different specialists, such as cardiologists, general practitioners, occupational health specialists, and insurance physicians who can share the responsibility to achieve returning to work in cardiac patients. Recognising and discussing factors that are important for returning to work, such as motivation, doctors’ advice, and having a supportive work environment may encourage the patient to return to work. In the daily practice doctors must know and must be keen on those factors.
they can influence to achieve return to work. Future research is necessary to evaluate whether intervention based on these factors can truly lead to achieve this goal.

**Conclusion**

Up to three months after hospital discharge, many ACS patients returned to work. Within two years, 74 patients (88%) at least returned to work once. Twenty patients (24%) did not return to work at pre-ACS levels. The most mentioned categories of facilitating factors to return to work were illness perception and not having signs or symptoms of heart disease. Physical incapacity, the existence of co-morbidity, mental incapacity, unfavourable terms of employment, less motivation, were top five categories of factors that hindered the return to work.

NSTEMI/UA patients returned to work significantly earlier than STEMI patients, and reasons hindering STEMI patients to return to work to pre-ACS levels opposed to NSTEMI/UA patients could be more often categorized as functional and environmental factors.
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