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# Transmural care in the rehabilitation sector: implementation experiences with a transmural care model for people with spinal cord injury

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## Abstract

**Purposes:** The purpose of this article is first to describe the development and content of a transmural care model in the rehabilitation sector, which aims to reduce the number and severity of health problems of people with spinal cord injury (SCI) and improve the continuity of care. Second, the purpose is to describe the applicability and implementation experiences of a transmural care model in the rehabilitation sector.

**Methods:** The transmural care model was developed in cooperation with the Dutch Association of Spinal Cord Injured Patients, community nurses, general practitioners, rehabilitation nurses, rehabilitation managers, physiatrists and researchers. The core component of the care model consists of a transmural nurse, who 'liaises' between people with SCI living in the community, professional primary care professionals and the rehabilitation centre. The transmural care model provides a job description containing activities to support people with SCI and their family/partners and activities to promote continuity of care.

The transmural care model was implemented in two Dutch rehabilitation centres. The following three aspects, as experienced by the transmural nurses, were evaluated: the extent to which the care model was implemented; enabling factors and barriers for implementation; strength and weakness of the care model.

**Results:** The transmural care model was not implemented in all its details, with a clear difference between the two rehabilitation centres. Enabling factors and barriers for implementation were found at three levels: 1. the level of the individual professional (e.g. competencies, attitude and motivation), 2. the organisational and financing level (e.g. availability of facilities and finances), and 3. the social context (the opinion of colleagues, managers and other professionals involved with the care). The most important weakness experienced was that there was not enough time to put all the activities into practice. The strength of the care model lies in the combination of support of patients after discharge, support of and cooperation with primary care professionals, and feedback of experiences to the clinical rehabilitation teams.

**Conclusion:** We recommend further improving and implementing the care model and encourage other care professionals and researchers to share their implementation experiences of follow-up care innovations for people with SCI.

## Keywords

transmural care, follow-up care, process evaluation, spinal cord injury

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## Introduction

The National Council for Public Health Care described transmural care as follows: 'Healthcare, geared to the needs of the patient, provided on the basis of co-operation and co-ordination between general and specialised caregivers, with shared responsibility and specification of delegated responsibilities' [1]. Since its

introduction in the early 1990s, transmural care has become very popular in the Netherlands, considering the number of running transmural projects. Transmural care is most often directed towards bridging the gap between different levels of care providers, for example between primary care and secondary care. It evolved as a reaction to perceived deficits in the organisation of healthcare: patients as well as care providers felt

there was not enough continuity, caused by deficient co-ordination between primary and secondary health-care. The care process of patients was interrupted when they moved from one health care provider to the next. By bridging the gap between different healthcare providers, the effectiveness, quality and efficiency of healthcare could be improved [2]. The transmurial care concept is not often used outside the Netherlands [3].

However, problems with continuity of care are not specific to the Netherlands, but occur in many other countries too [4, 5]. Here, integrated care is a more common term for activities aiming at improving continuity of care [4–6]. Integrated care deals with the integration of healthcare, social care and related services. It is more comprehensive than transmurial care since transmurial care generally does not include the whole care process of patients and is focused on one or two crucial transition steps between different types of healthcare providers [2].

In the Netherlands, the care needs of a specific chronic patient group often form the point of departure for transmurial care innovations [3]. However, in the rehabilitation sector such projects are sparse. This article describes the development and content of a transmurial care model for people with spinal cord injury (SCI), and the experiences with its implementation in two rehabilitation centres. People with SCI who are living in the community often have health problems, such as bladder and bowel problems, spasms, pain, and pressure sores [7]. However, due to the low prevalence of people with SCI, it is difficult for primary care professionals to gain enough knowledge and experience about the specific care these patients require. Therefore, there is a strong need for effective interventions aimed at the prevention of such health problems after discharge [8–14].

A transmurial care model could improve the continuity of care and reduce the number and severity of health problems of people with SCI living in the community.

The aim of this paper, therefore, is to study whether the transmurial care concept is applicable in the rehabilitation sector. More explicitly, it aims to provide insight into 1. the extent to which the transmurial care model was implemented; 2. enabling factors and barriers for implementation; and 3. the experienced strength and weakness of the transmurial care model.

Experiences with the implementation of follow-up care for people with SCI have hardly ever been described [15], but are in our opinion very important for health care professionals who are involved in the care for people with SCI and who may wish to use the transmurial care model or develop a similar intervention. A process evaluation is also important to be able to

interpret the results of an outcomes evaluation [16], in which the effects on the number and severity of health problems of people with SCI after discharge from clinical rehabilitation will be studied.

## Development and content of the transmurial care model

A project group was set up to support and guide the development of the transmurial care model and its implementation. This group comprised representatives of the Dutch Association of Spinal Cord Injured Patients, researchers (JE, MP, LdW, JB), and managers, physiatrists and nurses of the participating rehabilitation teams. The project group established a working group for the development of the transmurial care model. The working group consisted of 2 representatives of the Dutch Association of Spinal Cord Injured Patients, 2 community nurses, 1 general practitioner, 3 rehabilitation nurses from two rehabilitation centres and 3 researchers. A protocol for the transmurial care model was developed, based on results of research performed earlier [7, 9], and the practical and theoretical experience of the members of the working group.

The resulting model was presented for feedback to the rehabilitation teams of the two participating rehabilitation centres, the Dutch College of General Practitioners and the Dutch Association of Community Nurses.

The core component of the transmurial care model consists of a transmurial nurse, who 'liaises' people with SCI living in the community, primary care professionals and the rehabilitation centre. The transmurial nurse is a member of the clinical rehabilitation team (she also works as a nurse at the spinal cord unit) and is engaged for eight hours a week to perform the four main tasks:

- to support people with SCI and their partner/family with their health problems, which come within the scope of the nursing discipline;
- to support primary care professionals with the specific care for people with SCI;
- to promote continuity of care between primary care professionals and the rehabilitation team;
- to give feedback and take initiatives for improvements in care to the rehabilitation team, based on the experiences with patients

The transmurial care model provides a job description for the transmurial nurses, which contains activities to support people with SCI and their family/partners and activities to promote continuity of care (described in [Table 1](#)).

**Table 1.** Job description of the transmural nurses

<b>Activities to support people with SCI</b>	
1	To introduce the transmural care before discharge from clinical rehabilitation and to explore the needs of follow-up care, and to make agreements about this (Patients with SCI are free to decide whether or not to make use of the transmural care).
2	To give advice and support after discharge from clinical rehabilitation depending on the needs and the complexity of care by means of (at 3 weeks, 3, 6, 9, and 12 months after discharge):
2.1	telephone consultations on the initiative of the transmural nurse;
2.2	consultations in the rehabilitation centre (in addition to the periodical outpatient visit to the physiatrist);
2.3	home visits in case of health problems;
2.4	telephone consulting hours (consultation of the transmural nurse on the initiative of people with SCI).
3	To organise peer meetings after discharge.
<b>Activities to promote continuity of care</b>	
4	To introduce the so-called 'care compass': a little book which contains individual advice of caregivers to the patient, an overview of health services, and info sheets concerning several consequences and complications of SCI. The patient 'owns' the care compass, but it is also meant to support the caregiving by family/partners and professional caregivers.
5	To organise telephone consulting hours for primary care professionals.
6	To organise a meeting at the patient's home before discharge with the patient, the primary care professionals of all care disciplines involved with the care after discharge, and the transmural nurse to transfer care, in case of complex care.
7	To inform primary care professionals about the transmural care (content and accessibility).
8	To organise presentations to primary care professionals to inform them about SCI, prevention of secondary impairments and the specific care people with SCI need.
9	To organise presentations to the rehabilitation team to inform them about experiences with people with SCI after discharge and to make proposals for improvement in the clinical care, on the basis of the experiences with patients.
In all the contacts mentioned at 1 and 2 an assessment list is used to structure the discussion of total functioning.	

The transmural nurses had to link their activities closely to the care structures in the rehabilitation centre and the primary care. In the model this entails three consequences. Patients would have as much autonomy as possible to organise their own care after discharge. Second, primary care professionals are the people first and foremost to deliver care at home; and third, the transmural care nurses would not take over tasks from caregivers in the rehabilitation centre.

## The process evaluation

### Method

#### Intervention

In order to test the robustness of the transmural care model, the model was implemented in two Dutch rehabilitation centres (De Hoogstraat in Utrecht and Rehabilitation Centre Hoensbroeck in Hoensbroek, abbreviated here as DH and RCH). DH is situated in an urban area in the middle of the country, and RCH in a semi-urban region in the south of the Netherlands. Compared with DH, RCH admits patients from a larger area, including patients from Belgium. In general there are no large differences regarding the content of the clinical care in the two rehabilitation centres except that, compared with RCH, in DH the patients are stimulated slightly more to take responsibility for their own

care. Before the start of the project, the nurses of the inpatient SCI department of RCH were more involved with follow-up care than the nurses of the inpatient SCI department of DH. In RCH the physiatrist referred patients attending the outpatient-consulting hour to the nurses of the inpatient SCI department in the case of nursing problems. In DH, these patients were referred to the nurse of the day hospital.

All people with SCI discharged during a study period of 18 months were entitled to use the transmural care for at least one year after discharge. The total intervention period lasted 30 months. During the intervention period two researchers (JE, JB) met the transmural nurses every three months to support them with the implementation of the transmural care model and to help fine-tune their care to the needs of the clients. During this period two health care insurers agreed to finance the implementation of the intervention.

#### Participants

The process evaluation was performed among the transmural nurses of the two 'experimental' rehabilitation centres, and all people with SCI who were discharged from clinical rehabilitation during the study period of 18 months.

#### Measures

In each rehabilitation centre, the following 3 aspects of the intervention process were evaluated:

1. The extent to which all the activities of the trans-mural care model were performed. With regard to the individual support of people with SCI (activities 1 and 2 in [Table 1](#)), four aspects will be elaborated:
  - the number of the different types of contacts;
  - the time spent on the contacts;
  - the number and types of health problems for which interventions were applied;
  - the number and type of interventions applied during the contacts.
2. Enabling factors and barriers for the implementation of the trans-mural care model.
3. The experienced strength and weakness of the trans-mural care.

Data regarding these three aspects were collected in the following ways:

- structured registration forms administered by the nurses during the intervention period (aspect 1);
- interviews with the trans-mural nurses about their experiences with the intervention every 3 months during the intervention period of 30 months (aspects 1,2,3);
- participation of members of the research team in the 3-monthly meetings of the nurses in which the implementation of the trans-mural care was discussed (aspects 1,2,3).

### Analysis

The statistical package for the social sciences (SPSS) was used to describe the number and the content of the contacts the trans-mural nurses had with their clients (registration forms). The interviews with the trans-mural nurses were tape-recorded and the full

text was transcribed. All transcriptions were analysed to identify all the experiences the trans-mural nurses had regarding the implementation of the different aspects of the trans-mural care model, enabling factors and barriers for the implementation, and the experienced strength and weakness of the trans-mural care.

## Results

### Participants

We included 134 people with SCI, who had the possibility to use the trans-mural care during at least one year after discharge. There were 86 people from DH and 48 from RCH. The general characteristics of the response group are shown in [Table 2](#).

DH had a total of three trans-mural nurses during the intervention period. For practical reasons DH chose to have two nurses to perform the trans-mural care together. In this centre there were several changes in trans-mural nurses. The three nurses formed two pairs to give the trans-mural care. One pair gave the trans-mural care for 9 months, while the other pair did so for about 3 months. During the remaining 18 months of the intervention period a single trans-mural nurse performed the trans-mural care. The reasons for the changes were not related to the trans-mural care. RCH chose to have one trans-mural nurse to perform the trans-mural care. During the intervention period, there were two trans-mural nurses. One nurse gave the trans-mural care for 6 months and the other for a period of 2 years. All nurses can be considered experienced, since they had all worked for several years at a spinal cord department.

**Table 2.** Subjects characteristics

	DH (n=86)	RCH (n=48)	Total group (n=134)
Age, mean [yrs] (SD)	48.5 (15.1)	44.9 (16.4)	47.2 (15.6)
Men [%]	59.3	56.3	58.2
<b>Level and type of injury</b>			
Complete tetraplegia [%]	12.8	20.8	15.7
Incomplete tetraplegia [%]	17.4	18.8	17.9
Complete paraplegia [%]	37.2	35.4	36.6
Incomplete paraplegia [%]	29.1	25.0	27.6
Missing [%]	3.5	0	2.2
<b>Cause of injury</b>			
Traumatic [%]	62.8	66.7	64.2
Non-traumatic [%]	20.9	20.8	20.9
Combination traumatic and non-traumatic [%]	5.8	12.5	8.2
Missing [%]	10.5	0	6.7
Two or more times hospitalised in the rehabilitation centre [%]	37.2	33.3	35.8

## The extent to which the transmural care was implemented

In the first half of [Table 1](#) (activities 1–3) there are listed the activities to support people with SCI. [Table 3](#) displays the type and number of contacts (activities 1 and 2) the transmural nurses had with people with SCI for each rehabilitation centre and the total patient group.

### Activity 1: The introduction of the transmural care before discharge

The transmural care was not introduced to several patients before discharge. The transmural nurses mentioned that they regularly had to introduce the transmural care after discharge in cases where they had not been timely informed about the discharge or where the discharge occurred too suddenly. Especially

in DH there was a considerable number of patients (31.4%) who wanted to organise their care after discharge autonomously and to contact the transmural nurse on their own initiative if necessary.

### Activity 2: Advice and support after discharge

In both rehabilitation centres telephone consultations on the initiative of the transmural nurse (activity 2.1) were the most frequently used method to support patients after discharge (almost 75% of all patients received this type of support), while home visits (activity 2.3) were the method of support least used (less than 2% of all patients). The methods of support (activities 2.1–2.4) were more varied in RCH. In all contacts all transmural nurses used the assessment list to discuss the patients' functioning. Beside the types of support mentioned in the transmural care model (activity 2.1–2.4), e-mail contact was also

**Table 3.** Type and number of contacts with patients

	DH	RCH	Total group
<b>Type of contacts relative to number of patients</b>	<b>N=86 [%] (n)</b>	<b>N=48 [%] (n)</b>	<b>N=134 [%] (n)</b>
1 Introduction of care before discharge	65.1 (56)	75.0 (36)	68.7 (92)
2.1 Telephone consultations on transmural nurse's initiative	67.4 (58)	83.3 (40)	73.1 (98)
2.2 Consultations in the rehabilitation centre after discharge	8.1 (7)	54.2 (26)	24.6 (33)
2.3 Home visits	1.2 (1)	8.3 (4)	3.7 (5)
2.4 Telephone consultation on patient's initiative	14.0 (12)	27.1 (13)	18.7 (25)
E-mail on patient's initiative	3.5 (3)	2.1 (1)	3.0 (4)
E-mail on transmural nurse's initiative	3.5 (3)	0 (0)	2.2 (3)
Missing type of contact	2.3 (2)	12.5 (6)	6.0 (8)
<b>Number of contacts per patient</b>	<b>N=86 [%] (n)</b>	<b>N=48 [%] (n)</b>	<b>N=134 [%] (n)</b>
Patients with 0 to 2 contacts	17.4 (15)	8.3 (4)	14.2 (19)
Patients with 3 to 4 contacts	30.2 (26)	27.1 (13)	29.1 (39)
Patients with 5 or more contacts	20.9 (18)	52.1 (25)	32.1 (43)
Patients choosing to organise their care autonomously and to contact the transmural nurse on their own initiative if necessary	31.4 (27)	12.5 (6)	24.6 (33)
<b>Type of contacts relative to total number of contacts</b>	<b>N=241 [%] (n)</b>	<b>N=253 [%] (n)</b>	<b>N=494 [%] (n)</b>
1 Introduction of care before discharge	23.2 (56)	14.2 (36)	18.6 (92)
2.1 Telephone consultations on transmural nurse's initiative	64.3 (155)	48.6 (123)	56.3 (278)
2.2 Consultations in the rehabilitation centre after discharge	2.9 (7)	18.6 (47)	10.9 (54)
2.3 Home visits	0.4 (1)	2.8 (7)	1.6 (8)
2.4 Telephone consultation on patient's initiative	5.4 (13)	11.9 (30)	8.7 (43)
E-mail on patient's initiative	1.2 (3)	0.4 (1)	0.8 (4)
E-mail on transmural nurse's initiative	1.2 (3)	0 (0)	0.6 (3)
Missing type of contact	1.2 (3)	3.6 (9)	2.4 (12)

used in both rehabilitation centres. Sometimes these e-mails also contained digital photos of pressure sores.

Although the transmural care protocol was not very conclusive with respect to the number of contacts and other activities the transmural nurses had to perform, it indicated an average of about 6 contacts during the first year after discharge (including the introduction of the care before discharge and 5 contacts after discharge). Only 32% of all patients received all the number of contacts indicated in the transmural care model and 43% of all patients had 4 contacts or less. The RCH transmural nurses had relatively more contacts with the patients than the DH transmural nurses. In DH the number of patient contacts was not influenced by the fact that the nurse of the day hospital was occasionally involved in the follow-up care of patients. From the start of the project patients discharged from their primary rehabilitation directly approached the transmural nurses in case of questions/problems. Patients who had been hospitalised twice or more sometimes consulted the nurse of the day hospital, nearly always because of pressure sores. In both centres the transmural nurses spent an average of about 22 minutes per patient contact, including administration. In RCH the transmural contacts continued more often for more than one year after discharge, compared with DH (in RCH, 19 patients still had contact with the transmural nurse after one year of discharge, in DH, 5 patients).

Table 4 displays the number and types of health problems for which the transmural nurses applied interventions. Pressure sores were the most common health problem for which interventions were applied, followed by bowel and bladder problems. The percentage of

patients suffering from pain, bladder and bowel problems was considerably higher in RCH, as were the overall percentage of patients suffering of problems after discharge (DH: 47%, RCH: 67%), and the number of interventions per patient. The category 'other problems' included all kinds of both physical and psychosocial issues.

Table 5 displays the number and type of interventions the transmural nurses applied. Instruction, advice and health education was the most frequently used intervention in both centres. According to the notes on the registration forms of all patient contacts, psychosocial support was given considerably more often in RCH compared to DH. In 81% of all cases the transmural nurses were able to apply an intervention themselves. In 19% they referred the patients to other caregivers for advice. In case they had to refer patients, they mostly referred them to caregivers from the rehabilitation centre.

### Activity 3: Peer meetings

There were no peer meetings organised in either rehabilitation centre, although the nurses felt that patients would have appreciated it.

In the second half of Table 1 (activities 4 to 9) there are listed the activities to promote continuity of care. Compared to the individual support of patients, little time was spent on the activities to promote continuity of care.

### Activity 4: The introduction of the care compass

The care compass was introduced to almost all patients before discharge, but the transmural nurses

Table 4. The number and type of health problems for which interventions were applied

Problems for which interventions were applied	DH (N=86)		RCH (N=48)		Total group (N=134)	
	% of patients (N)	% of times (N)	% of patients (N)	% of times (N)	% of patients (N)	% of times (N)
Pressure sores	22.1 (19)	31.5 (29)	29.2 (14)	36.2 (59)	24.6 (33)	34.5 (88)
Bowel problems	11.6 (10)	20.7 (19)	25.0 (12)	14.1 (23)	16.4 (22)	16.5 (42)
Bladder problems	9.3 (8)	13.0 (12)	25.0 (12)	9.8 (16)	14.9 (20)	11.0 (28)
Pain	7.0 (6)	7.6 (7)	18.8 (9)	8.6 (14)	11.2 (15)	8.2 (21)
Facilities, equipment, housing (e.g., problems to arrange them or not having them)	5.8 (5)	6.5 (6)	6.3 (3)	3.7 (6)	6.0 (8)	4.7 (12)
Difficulties to tune care to the needs	7.0 (6)	7.6 (7)	8.3 (4)	3.1 (5)	7.5 (10)	4.7 (12)
Other problems	12.0 (8)	13.0 (12)	45.8 (22)	24.5 (40)	22.4 (30)	20.4 (52)
Total	46.5 (40)	100.0 (92)	66.6 (32)	100.0 (163)	53.7 (72)	100.0 (255)

**Table 5.** The number and type of interventions that were applied

Type of interventions	DH (N=86)		RCH (N=48)		Total group (N=134)	
	% of patients (N)	% of times (N)	% of patients (N)	% of times (N)	% of patients (N)	% of times (N)
Instruction, advice, health education	45.3 (39)	71.3 (77)	66.7 (32)	54.1 (99)	53.0 (71)	60.5 (176)
Psychosocial support	2.3 (2)	2.8 (3)	35.4 (17)	24.0 (44)	14.2 (19)	16.2 (47)
Advice for consultation caregivers from the rehabilitation centre	14.0 (12)	13.9 (15)	20.8 (10)	11.5 (21)	16.4 (22)	12.4 (36)
Advice for consultation primary care professionals	9.3 (8)	7.4 (8)	22.9 (11)	6.6 (12)	14.2 (19)	6.9 (20)
Other interventions	5.8 (5)	4.6 (5)	8.3 (4)	3.8 (7)	6.7 (9)	4.1 (12)
Total	46.5 (40)	100.0 (108)	66.6 (32)	100.0 (183)	53.7 (72)	100.0 (291)

felt that patients often did not use it in the way it was intended. Patients for instance seldom asked the members of the rehabilitation team to write down personal advice.

**Activity 5: Telephone consulting hours for professional primary caregivers**

Primary care professionals relatively seldom undertook initiatives to contact the transmural nurses during the telephone consulting hours in case of questions and/or problems.

In both rehabilitation centres the transmural nurses had 19 contacts with primary care professionals, mostly community nurses, because of pressure sores, bladder and/or bowel problems in 11 patients.

**Activity 6: Transfer of care meetings**

'Transfer of care meetings' were not organised as described in the transmural care model. In the case of complex care, 'transfer of care' meetings were organised by nurses of the clinical rehabilitation team, as they had been before the start of the project. In contrast to the proposed 'transfer of care' meetings in the transmural care model, these meetings took place in the rehabilitation centre (instead of at the patient's home) and only the nursing discipline was involved (instead of all professional primary care disciplines involved with the patient after discharge).

**Activity 7: Informing primary care professionals about the transmural care**

At the start of the project several community nursing services, regularly involved in the care for SCI patients, were informed about the project. After that, in both rehabilitation centres information flyers about the transmural care were sent to general practitioners and community nurses in the case of discharge. The

patients were also motivated themselves to inform their caregivers after discharge about the care.

**Activity 8: Presentations to primary care professionals**

In both rehabilitation centres the transmural nurses gave about three presentations about SCI to community nursing services. In DH these presentations were at the request of the patients themselves, since they experienced a lack of knowledge regarding SCI. In RCH the presentations had a more informative character regarding the content of the care and the specific care needs of patients with SCI.

**Activity 9: Presentations to the rehabilitation team**

Presentations to the rehabilitation team to inform them about experiences with patients after discharge and to make proposals for improvements in the clinical care on the basis of these experiences occurred only very occasionally. This kind of information was mostly given informally. According to the experiences of the transmural nurses, awareness of the importance of follow-up care of both rehabilitation teams increased during the intervention period, as did their critical attitude towards the content of the clinical care. In DH this increase became concrete with the start of a project to improve the discharge preparation of patients.

Beside the activities of the transmural care model, the nurses also performed some other activities, such as giving a presentation to nurses in hospitals about SCI, gaining additional knowledge (i.e. by means of visiting conferences), and giving advice to patients, who had already been discharged for several years (i.e. patients who were not included in the research population). Especially the RCH transmural nurse paid a lot of attention to this patient group.

## **Enabling factors and barriers for implementation**

For each aspect of the transmural care model, the transmural nurses mentioned several enabling factors and barriers for implementation, which could be grouped as follows:

### **(1) Factors related to the level of the individual professional**

The knowledge, skills and competencies of the transmural nurses and the support to train these appeared to be important, i.e. knowledge regarding SCI and the organisation of the primary health care system, skills and competencies regarding patient-centred care, conversation techniques, networking, and being able to serve as a liaison, mediator and a pioneer. Combining the role of transmural nurse and member of the clinical nursing team also demanded certain competencies. The fact that the transmural nurses were very eager to learn and enthusiastic helped the implementation. Several transmural nurses also experienced a need for education during the course of the intervention period to train the in competencies mentioned. The three-monthly meetings and the interviews with members of the research team were helpful in this respect. It helped the nurses to reflect on their activities, and to develop themselves regarding conversation techniques and to give care in a more patient-centred way. Too great a feeling of responsibility for the well-being of patients resulting in bringing up solutions and having a 'caring' attitude, sometimes hindered the transmural nurses in their work, especially in RCH.

### **(2) Factors related to the organisational and financing level**

At DH there was a stimulus to refer patients to the SCI nurse of the day hospital if nursing advice or instruction was needed after discharge. Such a procedure hindered the transmural nurses. This organisational structure had already been established for years, and, besides, the rehabilitation centre was able to claim expenses for those consultations (and not for the more 'preventive' consultations). Another limitation was caused by the fact that the members of both rehabilitation teams (except for the physiatrist) did not have the time or responsibility to pay attention to patients after discharge except when day hospital care was indicated. On the other hand, the transmural nurses mentioned that the combination of being a transmural nurse, a nurse at the spinal cord department, and a member of the rehabilitation team increased the possibilities to confer if problems arose that were outside the nursing scope and to give feedback about the transmural care (and the implications).

According to the transmural nurses, important working conditions appeared to be having a computer, a mobile phone and a consultation room at one's disposal, a work schedule in harmony with the transmural care, and being able to spend 8 hours on the transmural care on one day. Especially during the first 10 months of the intervention period, lack of these facilities hindered the performance of the DH transmural nurses. Besides, all nurses found the workload of the transmural care model far too high to accomplish in 8 hours per week, which was the reason for the first transmural nurse at RCH to quit the project. E-mail contact and sending digital photos by email in the case of pressure sores sometimes helped the transmural nurses to give support.

### **(3) Factors related to the social context (the opinion of colleagues, managers and other professionals involved with the care)**

It appeared very important that the intervention protocol matched the vision the centres had on rehabilitation. At DH the managers of the rehabilitation team instructed the transmural nurse to be very reserved regarding some transmural care activities (like home visits, consultations in the rehabilitation centre, and organising peer meetings). Partly, in their opinion, some activities were judged to be too patronising. Compared with RCH, it was more strongly felt at DH that the patient should take responsibility for his/her own care, and should take the initiative to contact the transmural nurse if necessary. In their opinion the transmural nurses should not take the initiative for patient contacts.

## **Experienced strength and weakness of the transmural care model**

In general the transmural nurses did not experience many weaknesses in the content of the transmural care model. The most important weakness was that there was not enough time to put all the activities into practice. Furthermore, they experienced a certain tension between stimulating patients to organise their own care on the one hand, and protocol prescriptions on the other hand. Initiating contacts with patients on set moments and using an assessment list sometimes made the nurses feel they were patronising patients too much.

According to the transmural nurses, the strength of the transmural care lies in the possibility to give support to patients and primary care professionals after discharge. They also felt that their support was appreciated and that it created an opportunity to detect problems and to intervene at an early stage. The use of the assessment list contributed to the detection of problems that many patients more or less accepted as

being normal when they had an SCI. The transmural nurses had the idea that they had been able to prevent readmissions because of pressure sores. They also strongly believed that their advice regarding bowel problems increased the quality of life for several patients. Beside the support to patients after discharge, they were also able to use their experiences in their clinical activities. It helped them to prepare patients better for discharge and to communicate the implications of their experiences to the rehabilitation team.

## Discussion

In this paper, we analysed the implementation of a transmural care model in two rehabilitation centres. We observed that, although all transmural nurses spent most of their time on the individual support of patients after discharge, only 32% of all patients received the number of contacts indicated in the protocol (6 contacts). At DH the number of contacts and the variation in types of contacts were less compared with RCH. Pressure sores were the most common health problem for which interventions were applied, followed by bladder and bowel problems. The percentage of patients suffering from problems after discharge and the number of interventions per patient were lower in DH.

Compared to the individual support of patients, in both rehabilitation centres little time was paid to activities to promote continuity of care (activities 4–9 in [Table 1](#)). This contributes to our conclusion that the transmural care model was not implemented completely as planned, with a clear difference between the two centres. Possible explanations for these differences may be found in differences in the two study populations, and in the results regarding enabling factors and barriers. When comparing the study populations, the most eye-catching difference concerned the size. The fact that the transmural nurses of DH had to serve more patients in the same time certainly will have influenced the number and type of contacts after discharge. Sometimes, for instance, it was desirable, but in the nurse's opinion not feasible to visit a patient at home. It was also notable that there were significantly more patients in DH who let the transmural nurse know that they wished to organise their care autonomously and thus decided not to use the transmural care intensively. This last difference possibly might be caused by differences in: the 'natural' level of assertiveness of patients in the two different Dutch regions; and the attention the rehabilitation centres/transmural nurses have for training the patients to take responsibility for their own care. Comparison of the results regarding enabling factors

and barriers, especially the vision on rehabilitation, the organisational and financing structure of the rehabilitation centre, and the working conditions, reveals that the DH transmural nurses experienced many more barriers compared with the RCH nurses.

Taking these findings into account, we recommend improving and further implementing the transmural care model. In our opinion and in the opinion of the transmural nurses, the combination of support of patients after discharge, support of and cooperation with primary care professionals, and feedback of experiences to the clinical rehabilitation teams, creates many opportunities to prevent and treat health problems and to improve the quality of care. To improve the model, it is most important to tailor the care more to the patients' needs. Instead of holding to six moments of contact during the first year of discharge, there should be more dialogue between the patients and the rehabilitation professionals about what, how and when. Secondly, the target population should be extended, since people who have already been discharged for several years, regularly experience health problems. In order to improve the implementation of this or other interventions in day-to-day rehabilitation practice, our implementation leads us to the following recommendations:

1. The individual professionals should be provided with enough education on the competencies needed in their new function (regarding patient-centred care, conversation techniques, networking and the ability to serve as a liaison, mediator and pioneer).
2. With respect to the organisational and financing level (e.g. availability of facilities and finances), enough time should be available to put the intervention into practice. In addition, the intervention should be embedded in the local organisational structure. Moreover, it should also be embedded in the payment system. In this respect we recommend that the effectiveness and the costs of the intervention are evaluated.
3. With regard to the social context, attention should be paid to creating support for the intervention at both managerial level and the level of professionals indirectly involved with the implementation.

A limitation of our study was, in our opinion, that the results concerning the content of the patient contacts were based on the nurses' records and not on a full record of what had been said and done. The nurses often may not have recorded giving psychosocial support as a separate intervention. Therefore, the number of problems and interventions described may be an underestimation of the actual number of problems and interventions applied. Despite this, and

although our study was small and only included the experiences of the transmural nurses (and not those of the patients and other caregivers), our results may help other health care professionals and researchers who wish to use the transmural care model or to develop and implement a similar intervention. In line with Grol and Wensing [17], we found enabling factors and barriers for implementation at three levels: 1. the level of the individual professional (e.g. competencies, attitude and motivation), 2. the organisational and financing level (e.g. availability of facilities and finances), and 3. the social context (the opinion of colleagues, managers and other professionals involved with the care). We also found that the nursing discipline can have important input in the follow-up care of patients with spinal cord injuries. After all, pressure sores, bladder and bowel problems evidently fall in the scope of the nursing discipline. In our opinion, it is also possible to extend the transmural care model with other types of care, such as telemedicine. In our study, one method of telemedicine, i.e. using digital photos, was used spontaneously in the case of pressure sores, but the literature reports more applications of telemedicine in the care for patients with SCI [18–23].

Finally, we would like to encourage health care professionals and researchers to share their implementation

experiences, with regard to follow-up care innovations for people with SCI, in order to be able to improve the care for such people in the long term. Our review [15] revealed only a small number of follow-up care innovations described in literature, in which little attention is paid to the evaluation.

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