Main findings

Main aim of the present study was to discuss the impact of changes in emotion and cognition on the lives of community dwelling stroke patients and partners in the acute and chronic phases after stroke. The present study demonstrated that changes in emotion and cognition were reported at three and fifteen months post-stroke by almost all of our stroke patients living in the community, irrespective of the side of lesion. At fifteen months post-stroke, only ten to fifteen percent of patients and an even lower percentage of partners did not report any changes. Although on both times of measurement partners tended to report a greater number and more severe changes than patients themselves, these differences were significant in the right hemisphere group only.

The number and severity of changes in emotion and cognition reported by patients slightly increased between three and fifteen months post-stroke. In contrast, anxious and depressive mood attributed to stroke and fatigue showed some improvement between three and fifteen months post-stroke. Nevertheless, at fifteen months post-stroke, stroke patients still reported more severe depressive mood and more frequent fatigue than control subjects. However, unexpectedly the level of anxiety did not differ between stroke patients and controls. Changes in emotion and cognition, psychosocial disabilities, mood and fatigue showed complex interrelations. While psychosocial disabilities best predicted post-stroke mood, mood and changes in emotion and cognition in turn predicted fatigue after stroke. The present study further illustrated that the psychosocial status of stroke patients must be considered within a broad health context. Not only stroke-related factors, but also diseases and life events other than the stroke influenced fatigue and mood respectively after the stroke event. A stroke generally does not develop ‘out of the blue’ and often coincides with comorbidity.
When investigating well-being of stroke patients and partners, it appeared on the one hand that life satisfaction deteriorated after the stroke event. As life satisfaction is generally considered to be stable across the life span, the decrease of satisfaction after stroke gives an impression of the impact of stroke. On the other hand, most patients and partners were able to maintain a positive view on life, although a quarter of partners reported increased strain.

It might not be coincidental that while male stroke patients reported poorer life satisfaction than male controls, their female spouses reported significantly greater emotional strain than male spouses. Emotional and cognitive changes in the patient appeared to influence both emotional and physical strain on the partner. These changes did not directly affect life satisfaction of the partner, but were mediated by the level of strain. In stroke patients, cognitive functioning at three months after stroke was related to the restoration of activities within the first fifteen months after stroke. Furthermore, both complex cognitive functions and activity level at three months post-stroke predicted life satisfaction at fifteen months post-stroke.

Throughout the study, right hemispheric stroke patients with attentional disorders stood out as a group with a distinct outcome after stroke. In this group, the severity of unilateral neglect was longitudinally related to less awareness of the changes in emotion and cognition compared to one’s partner. Furthermore, slower mental speed was related to a higher frequency of fatigue while the presence of neglect was related to a lower activity level at fifteen months post-stroke. In contrast, levels of distress in right hemispheric stroke patients with neglect showed greater improvement than in subjects without neglect. However, the opposite was found for partners, with greater unawareness of changes in emotion and cognition in the patient related to greater distress of their partner.

To sum up, changes in emotion and cognition were common in stroke patients living in the community and cannot be regarded as temporarily phenomena. Changes in emotion and cognition had several consequences for lives of patients and partners alike, influencing mood, fatigue, activities, strain and eventually life satisfaction of patient and partner.
Critical remarks

The present study has several limitations which influence the power of the study and the generalisability of the results to stroke patients living in the community. First of all, although the initial number of patients presented by GPs was sufficient, 15 percent of patients did not meet the criteria of a clinically first-ever, unilateral ischemic stroke. These criteria were formulated to compose a homogeneous group of stroke patients, but were quite strict as they excluded haemorrhages, patients with bilateral ischemic strokes and patients with a recurrent stroke. Another strict criterion that 5 percent of patients could not meet was that they should have been devoid of neurological or psychiatric disorders before the occurrence of the stroke. Subsequently, another 30 percent of patients could not be included at the first assessment because of severe disability, death or refusal. To facilitate participation in the study, the interview and the first neuropsychological assessment session were always held at the patient’s home. If necessary, neuropsychological data at the second session were also collected at the patient’s residence. Furthermore, the interview and the neuropsychological assessment were adapted in order to be able to include aphasic stroke patients. However, the presence of some communication skills was a prerequisite for the interview, therefore patients with severe aphasia or severe behavioural disturbances were excluded. The neuropsychological assessment required patients to be able to concentrate for at least half an hour, to have sufficient visual perception and to be able to manually respond to the stimuli, so patients with severe physical disabilities were also excluded.

Furthermore, during the study nearly 20 percent of these patients dropped-out before the second interview, while another 20 percent did not perform a second neuropsychological assessment. Stroke patients who dropped-out during the study were more severely disabled with regard to the physical, cognitive and emotional domains. It can be concluded that the sample of patients that performed all assessments in the present study was biased towards the less disabled stroke patients. To investigate whether patients included in the study were also biased towards those with a better health status, the prevalence of stroke-related comorbidity in the study sample was compared to comorbidity of patients from a regional database of general practices. Stroke-related comorbidity of patients in both groups appeared to be very similar, so patients referred to the present study by their GPs did not only involve patients with a lower vascular risk profile.
Although the number of patients included at both T1 and T2 was sufficient for overall data analyses, at times subgroups became too small to allow statistical comparisons. To increase the statistical power of the present study, stroke patients were also enrolled into this study at a hospital stroke unit. Analyses of stroke characteristics, however, indicated that the group recruited at the stroke unit differed slightly with regard to silent infarctions preceding the stroke, which might indicate a different vascular risk profile before stroke. Future researchers must consider the possibility of different stroke types and risk profiles of stroke patients admitted to a hospital stroke unit.

A successive stratified randomisation procedure was used to select patients from 4 general practices in the control group. An individual procedure in which each patient was matched to a control subject based on several characteristics such as age, gender and SES would have been more accurate. Quite unexpectedly, stroke patients and controls were comparable with regard to several risk factors for stroke. Because of the presence of vascular risk factors, it cannot be ruled out that some control subjects may have suffered asymptomatic damage to the brain. Because several risk factors, such as age, gender, region of residence and comorbidity were equally distributed among the stroke and control group, the distinct effects and impact of stroke on emotion and cognition could be studied. Moreover, the recruitment of both stroke patients and control subjects by GPs is to be preferred rather than the recruitment of relatively healthy elderly, for example by newspaper advertisements.

Although the research questions of the present study addressed behaviour, emotion and well-being of patients, the presence of neuro-imaging data concerning the extent and site of the lesion could have been of great benefit. This would allow to study the relationships between lesion characteristics and behaviour beyond the effects of lateralization of the lesion. Although CT-scans were available for almost all patients, these scans were made shortly after the onset of stroke resulting in a large proportion of negative findings. MRI-data were only available for a very small proportion of stroke patients. To obtain an indication of the stroke severity, the NIH stroke scale scores were rated retrospectively based on neurological reports. However, only those stroke patients admitted to a hospital were systematically screened on all symptoms. It appeared that in thirty percent of the patients the NIH stroke scale could not be completed because of missing data. This stroke severity score was therefore not included in the analyses. It should be determined which measure of acute stroke severity is useful in community-based studies.
As will also be addressed in the following paragraphs, during the initial phase of the study, selecting well-validated Dutch measurement instruments aimed at studying emotion and behaviour after stroke proved to be difficult. Therefore most of the instruments used in the present study were generic in nature and were not specifically designed to study impairments and disabilities after brain injury. The reliability of the measures included was assessed in the present patient group and appeared to be adequate. Nevertheless, emotion and behaviour after stroke could be measured more specifically with specific rather than generic scales that are developed and validated to address deficits after brain injury.

Implications for future research

First of all, in order to replicate and extend current findings, future studies into the emotional and cognitive consequences of stroke should include a larger number of community dwelling stroke patients. This may be difficult, however, and requires studies to be extended to larger demographic regions. In addition, several issues that have been investigated in the present study could be refined or examined in more detail. To date, the relative contribution of brain lesions, pre-morbid personality and coping to the emotional outcome after stroke is largely unknown. Of all aspects of emotion and behaviour, only post-stroke depression has received considerable interest in recent years. Nevertheless, many questions have remained unanswered, partly because a dualistic approach, with either attention for the direct consequences of brain damage or the indirect emotional reactions, has long been favoured. Above all valid measurement instruments need to be developed for the assessment of the emotional consequences of stroke. In order to gain insight into the specificity of emotional reactions after stroke, changes in emotion and cognition could also be assessed in a group of patients suffering from a similar acute disease with a subsequent chronic course without the presence of brain injury such as amputees or patients with a myocardial infarction. Furthermore, by including neuro-imaging data at more than one point in time after stroke, the course of emotion and cognition can be related to possible recovery of brain functioning after stroke. A further investigation into the role of personality and coping on emotional outcome after stroke would contribute to the development of treatment programmes.
During the study, the question arose as to what extent premorbid functioning is already affected by comorbidity and vascular changes to the brain. Fatigue and depression, for example, have been described as risk factors to stroke and might already be present before stroke onset (Schuitemaker et al., 2004; Jonas & Mussolino, 2000). In addition, silent infarctions to the brain could have influenced overall cognitive functioning prior to the occurrence of a stroke event (Price et al., 1997). To gain insight into the course of mood, fatigue and cognition during the pre-stroke and post-stroke time periods, a prospective community-based study in patients with vascular comorbidity should be conducted.

Until recently, fatigue after stroke has been a neglected issue in research concerning the outcome after stroke. The present study showed that not only in severely physically disabled patients, but also in stroke patients with mild physical disability living in the community, levels of energy can be diminished long after stroke onset. Further investigation into the relationship between different cognitive functions and mental fatigue might provide direction to the development of the optimal treatment of fatigue after stroke. It would be valuable to be able to distinguish between different types of fatigue after stroke and their possible neurological and behavioural correlates. Fatigue scales that capture both physical and mental aspects of fatigue need to be validated in patients with brain injury.

In the present study, male patients and female partners appeared to have less favourable outcomes after stroke. It would be very interesting to investigate patterns of dyadic coping after stroke. Couples may react to each other’s way of coping with stressful situations, which in turn may influence their individual well-being. For example spouses may employ coping strategies that will help the partner at their own expense of emotional well-being. Furthermore, attempts to regulate one’s reaction to a stressful event may limit emotional sources to support the other (Gottlieb & Wagner, 1991, Wood et al., 1990). The interaction between coping of patients and their partners has hardly been addressed in stroke research.

Finally, there is a need for research concerning the efficacy and timing of treatment methods for the emotional, behavioural and cognitive consequences of stroke. As will be discussed in the following paragraphs, evidence based on randomised controlled studies should expand the basis for administering cognitive rehabilitation and psychotherapy tailored to patients with brain injury.
Implications for clinical practice

In the following paragraphs implications for the assessment and treatment of emotional and behavioural consequences of stroke in clinical practice will be outlined. For a discussion concerning the clinical implications with regard to the cognitive sequelae of stroke, one is referred to the dissertation of Gerritsen (2004).

Assessment of changes in emotion and behaviour after stroke

In clinical practice, a thorough investigation of changes in emotion and behaviour after stroke should be conducted because, in nearly all patients, several aspects of emotional experience, emotional expression or behaviour can be subject to change. The present study showed that patients will not always be able to identify changes that have occurred after stroke. Observations of close relatives should complete the accounts of patients themselves.

Valid Dutch questionnaires measuring both pre-morbid and post-stroke emotion and behaviour are still lacking. The questionnaire used in the present study emphasised the most prevalent behavioural and emotional changes after stroke. In clinical practice, a more extensive range of changes should be addressed. The present scale might be adapted for this purpose and evaluated in a larger cohort of stroke patients.

Changes in emotion and behaviour after stroke can be regarded as the result of a complex interaction between pre-morbid personality, emotional reactions to the stroke event and changes caused by injury to the brain. It seems difficult to disentangle the emotional reactions or coping responses from changes induced by the brain injury. Recently, different studies have attempted to distinguish emotional denial from anosognosia based on information generated by a close examination of the behavioural reactions of the patient. The results showed that emotional reactions such as anger or avoidance coping appeared to be more closely linked to psychological denial than to impaired awareness of deficits (Kortte, Wegener & Chwalisz, 2003, Prigatano & Klonoff, 1997). Although in clinical practice the direct and indirect consequences of stroke cannot be distinguished easily, pre-morbid and current coping responses of the patients should always be assessed when studying post-stroke emotion and behaviour.
Assessment of depression and anxiety after stroke

Besides the more or less subtle changes in emotion and cognition, a smaller proportion of stroke patients may develop neuropsychiatric disturbances such as anxiety disorders, depression, pathological laughing or crying or mania (Gerritsen, Visser-Keizer & Deelman, 2002). The methods often used to assess emotional and behavioural disturbances are either semi-structured interviews based on DSM-criteria or questionnaires. When evaluating psychiatric disturbances in stroke patients by DSM-criteria some problems can arise. The diagnostic system of the DSM generally defines psychiatric problems irrespective of their aetiology. However, in order to diagnose some disorders, such as major depression or generalised anxiety disorder, the presence of a general medical condition must be ruled out. Another problem is that many symptom derived criteria of the DSM involve non-specific somatic complaints or cognitive deficits, such as fatigue or difficulties in attention or memory, which have also been found to occur without depression or anxiety in stroke patients.

One of the current problems in the assessment of emotion and behaviour after stroke using questionnaires, is that most available measures have been designed for psychiatric populations. Apart from determining whether these instruments can assess emotion and behaviour after brain injury in a valid and reliable way, the notion of change is hardly addressed. In our opinion, in measuring post-stroke depression or anxiety, an emphasis must be placed on the mood of the patient, such as diminished interest, pleasure or worries of the patient. Therefore, the Hospital Anxiety and Depression Scale (HADS) was chosen in the present study. The HADS is a screening instrument for depressive and anxious mood, but does not represent a clinical diagnostic tool. An advantage of this instrument is that it excludes vegetative symptoms, which tend to overestimate mood disturbances after stroke. Furthermore, as depression and anxiety often co-occur, the screening of both is preferred.

The HADS has been proven useful in assessing psychiatric patients, somatic patients including stroke patients, primary care patients and patients in the general population (Bjelland et al., 2002, Johnston et al., 2000). Based the suggestions of Johnson et al. (1995) for a community-based sample, in the present study cut-off scores of 5 for the depression scale and 6 for the anxiety scale were used. However, in clinical samples a stricter cut-off value of 8 or more for both anxiety and depression scale is recommended (Bjelland et al., 2002).
In the present study we have tried to capture the notion of change in mood, by asking patients if elevated levels of mood could be attributed to the stroke event. It appeared that patients were able to make this distinction. A pitfall for clinicians is to ascribe all seemingly abnormal behaviour to the effects of stroke. The present study, for example, showed that half of the disturbances in mood were attributed to causes other than stroke. To avoid this potential bias, information on pre-morbid behaviour, personality and life events before and after stroke should be obtained. Furthermore, the way patients coped with pre-stroke difficulties in life must be assessed. The present study also showed that depressive and anxious mood was classified differently on a self-rated scale and observation-based criteria. It is recommended that several sources of information are combined when measuring mood after stroke. Both subjective reports of the patient and of relatives and observations of behaviour should be included.

_Treatment of emotion and behaviour after stroke_  
Although several necessary or highly recommended components of the psychological treatment of emotion and behaviour after brain injury have been addressed, to date no randomised controlled trials have been conducted on this subject. The ICAR model, for example describes four basic elements in managing psychiatric disturbances after brain injury, but this model has not been evaluated in controlled research (Prigatano et al., 2003). The components of the ICAR model (Information, Contingency, Awareness and Relationship) will be discussed below with regard to the treatment of stroke patients.

Before the start of the treatment of emotional and behavioural disturbances in stroke patients, conducting a neuropsychological assessment is highly recommended. One should of course be aware that mood disturbances and medication might influence test results. Nevertheless, having an indication of the current cognitive status of the patient at one’s disposal will often be beneficial. The treatment methods described below should always be adapted to the cognitive abilities of the patient.

The first component in the ICAR model is providing information to patients and their family with regard to the emotional and behaviour sequelae of stroke. A systematic review has indicated that information provision to stroke patients and carers seemed more efficient when it is embedded in an educational context than the simple provision of a booklet or leaflet (Forster et al., 2001). The content and sources of information should be adapted to the patient’s cognitive abilities (Wachters-Kaufman et al., 2004).
Furthermore, information must be provided by skilled professionals in a clinically sensible and sensitive way (Prigatano et al., 2003). Providing information about the nature of emotional and behavioural problems after stroke might help to reduce anxiety and to prevent misunderstandings. In addition, the recognition of emotional and behavioural impairments can lead to specific interventions.

The second element in the management of behavioural problems after stroke is helping the patient regaining control over his or her emotional and behaviour responses by placing contingency on certain behaviour (Prigatano et al., 2003). Behavioural therapy can, for example, be effective in reinforcing appropriate behaviour or in the extinction of undesired behaviour (Ducharme, 2000). Stroke patients might lack the mental ability and flexibility to replace maladaptive behaviour by more effective behaviour on their own. If a patient is not at all capable of changing a behavioural pattern, attention must be directed to adapting the environment and education of their social system. The use of psychopharmacy might also be helpful in controlling behaviour. Antidepressants, for example, have been proven to be effective in reducing the frequency and severity of crying or laughing episodes after stroke (House et al., 2004).

The third factor in the ICAR model is to help patients to deal with disturbances in self-awareness. The present study showed that lack of awareness of deficits after stroke may not only impede rehabilitation, but can also be related to distress in those individuals surrounding the patient. Methods that have been described to increase awareness in the patient include giving feedback to the patient on their performance of activities or tests. Recent studies indicate that awareness may arise when these activities resemble or are identical to those performed in daily life before stroke (Dirette, 2002).

The final element in the management of behavioural and emotional problems might be by dealing with these disturbances in a therapeutic relationship. The use of psychotherapy in brain damaged individuals has long been considered inappropriate. However, the therapeutic opportunities provided by neuropsychotherapy, in which psychotherapeutic techniques are adapted to the deficits of brain injured patients, seem highly promising (Judd, 1999). As has been described previously, randomised controlled trials in which the efficacy of psychotherapy after stroke is assessed are rare. With regard to the treatment of depression after stroke, two systematic reviews have recently been published. These reviews identified a small but significant effect of psychotherapy on
improving mood after stroke, but no effect of either pharmacotherapy or psychotherapy on the treatment of depression after stroke (Anderson, Hackett & House, 2004, Hackett, Anderson & House, 2004). Recently, fatigue after stroke has also been classified among the emotional sequelae of stroke (Bogousslavsky, 2003). Neuropsychotherapy could be helpful in teaching patients to cope with fatigue after stroke. Current programmes that address fatigue after stroke should be evaluated in controlled trials.

It must be emphasised that the partner or other family members should be involved in the psychological treatment of stroke patients. They should not only be given information on the consequences of brain injury, but must also be taught ways to cope with these changes. The present study indicated that male and female partners may have different needs, which may demand different approaches.

**Implications for stroke care**

*Public awareness and recognition of changes in emotion and cognition after stroke*

In 1995, the Dutch Heart Foundation already published a report called 'Care after Stroke' in which several recommendations concerning patient care were described. One of the recommendations included was to pay attention to the observation that cognitive and emotional problems often become apparent during the recovery phase, which are often not understood by the patient and not recognised by health care providers. The neuropsychological disturbances require further investigation by either a neuropsychologist or a clinical linguist. However, these diagnostic specialists are not available everywhere or all the time. Even where this is not the case, they are often not consulted, either because the problem is not recognised or the attending physician finds no grounds for a referral (Meyboom-de Jong & Buis, 1995).

At the present time, the awareness of the mere existence of emotional and cognitive disturbances after stroke still is not widespread in the Netherlands. A recent population-based inquiry into the symptoms of stroke by the Dutch Heart Foundation showed that indeed most people are under the impression that a stroke only results in paralysis of the body. Only 8 percent of those interviewed reported neuropsychological consequences of stroke.
To increase the proportion of acute stroke patients that will be referred to a hospital within three hours after stroke, a public health campaign will be launched in the Netherlands directed at recognising the signs of stroke. In this campaign, the FAST (Face-Arm-Speech-Time) test will be promoted. This test describes impairments in motor functioning or speech as the most prominent signs of stroke. Hospital-based studies have reported that approximately 80 percent of patients present with a hemiparesis in acute stroke (Rathore et al., 2002, Melo & Bogousslavsky, 1998). It has not been documented properly how many stroke patients living in the community do not suffer from physical impairments in the acute phase after stroke. It can be estimated that at least 1 in every 5 stroke patients will not present with distinct visible physical impairments shortly after stroke onset. In the present study at three months post-stroke, 43 percent of patients did not demonstrate a paresis of the arm, 53 percent did not show paresis of the leg, while 37 percent had neither of these symptoms. Research has shown that the FAST-test can detect most total anterior circulation infarctions, but is less sensitive in detecting posterior circulation infarctions or lacunar infarctions (Nor et al., 2004, Harbison et al., 2003). Of the patients in the present study with OCSP-classifications, most suffered from lacunar infarctions (47%), with only a small proportion of total anterior circulation infarctions (11%). Although faster recognition of the physical symptoms of stroke is needed to improve acute stroke care, patients with mainly cognitive and emotional problems after stroke might go unnoticed by this test. Several case reports have shown that emotional or cognitive disturbances might be the only or the most prominent consequences of stroke. The cerebrovascular origin of the disturbances may not be recognised in these patients (Price, Whitlock & Hall, 1983). An unnecessary referral to mental health services, an inaccurate treatment or no treatment at all may be among the serious consequences.

The recognition of changes in cognition and emotion by clinicians will be influenced by the patient’s presentation of symptoms. Research has shown that, after stroke, gender differences can exist in the presentation of neuropsychological complaints. A large American study found that female stroke patients were far more likely than male stroke patients to report symptoms of changes in consciousness and disorientation after stroke at the emergency department. Male stroke patients were more likely to report traditional stroke symptoms such as hemiparesis (Labiche et al., 2002). The identification of stroke types representing with symptoms other than mainly physical symptoms is a major challenge to clinicians. Knowledge about the emotional, behavioural and
cognitive consequences of stroke is still lacking. Efforts should be directed to increasing awareness of these changes in the general population and in clinicians. It may be difficult to reach many of the people at risk, such as those with a low socio-economic status. Not only in the acute phase after stroke, but especially in the post-acute phase, clinicians should be aware of the long-term changes in emotion and cognition and their impact on daily life. (Neuro) psychologists can play an important role in the education of medical and psychology students, and in increasing the knowledge among health care colleagues about the cognitive and emotional sequelae of stroke.

**Stroke care in the Netherlands**

During the last years, quite an effort has been invested into the establishment of stroke services in the Netherlands. A recent publication of the Dutch Heart Foundation showed that in 2003 stroke services have extended to 69 services nation-wide (Verschoor, Stolk-ker & Franke, 2003). Most stroke services in the Netherlands incorporate a hospital with a specialised stroke unit, a nursing home, a rehabilitation centre and a home care organisation. In a quarter of stroke services, however, GPs do not participate, while half of the stroke services do not offer systematic care in the chronic phase after stroke. It is unknown in how many stroke services neuropsychologists participate. It is recommended that neuropsychologists always participate or are consulted in both the acute phase and the chronic phases after stroke. In the stroke services that follow-up patients into the chronic phase, home care visits by a nurse is one form of care provided. Nurses are taught to screen the presence of changes in emotion, behaviour and cognition by using a questionnaire. An advantageous component to this approach is that patients are visited at regular times after stroke. Because of the emotional or cognitive disturbances after stroke, patient will not always be able to implement visits to health care practitioners. It can be questioned, however, to what extent patients will be able to provide an adequate account of the changes in emotion and cognition after stroke. The present study shows that the accounts of patients should be supplemented by reports of close relatives. Furthermore, nurses must be able to observe and recognize cognitive deficits and emotional and behavioural disturbances after stroke during the home visits. In addition, regional availabilities of additional expertise in diagnosis or treatment of these problems should be known.

Another recent beneficial development is that several rehabilitation centres provide neuropsychological assessment, cognitive rehabilitation and neuropsychotherapy to
stroke patients in the chronic phase after stroke. Since the 1980's and 1990's rehabilitation centres in the Netherlands have increasingly directed attention to the neuropsychological consequences of stroke. Since the 90's of the previous century, patients without apparent physical disabilities and their partners have access to cognitive rehabilitation programmes in the acute but also in the chronic phase after stroke. However, the availability of these outpatient treatment programmes is not widely known among patients and clinicians. Care in the chronic phase after stroke is fragmented, with different organisations providing care for different time periods. Future efforts should be directed at increasing awareness of the treatment options for the emotional and cognitive sequelae of stroke and at improving continuity of care in the chronic phase after stroke.

**Role of GP in chronic care after stroke**

In the concept National guidelines of the Dutch College of General Practitioners attention has been paid to the cognitive and emotional consequences of stroke. In particular in the rehabilitation phase, neuropsychological assessment (if necessary) is recommended. However, also in the chronic phase after stroke when patients reside at home again, attention must be directed at the cognitive and emotional changes. Either the GP or the nursing home practitioner should inquire on this matter, as these disturbances may affect activities of daily life including leisure activities, the ability to drive a car or the ability to return to work. As has been demonstrated by the present study, patients and partners may differ in their perception of cognitive deficits and emotional problems, partly because of the patient’s impaired awareness. In cases when either patients or their partners or the health care providers themselves - doctors, nurses, paramedics - have questions concerning possible cognitive or emotional disturbances after stroke, a neuropsychological assessment can help to gain insight into the neuropsychological functioning of the patient. Furthermore, the knowledge of deficits and reactions of the patient can give directions to the implementation of further interventions, including cognitive rehabilitation or neuropsychotherapy. To sum up, if GPs treat stroke patients according to the concept College Guidelines, many cognitive and emotional problems might be treated appropriately to the benefit of both patients and their partners. In the chronic phase after stroke providers should remain alert for possible so called ‘hidden consequences’ of stroke. These problems may cause great distress in the lives of patients and partners.
References


General discussion and conclusions


