Summary
Foot pain and related functional limitations are common and the chance of developing foot pain increases with age. Approximately 1 in 4 women and 1 in 7 men older than 50, have foot pain, of which 60% is located in the forefoot. Having foot pain and possibly a subsequent functional limitation can affect mobility, increase the chance of falling and affect general sense of well being. The cause of developing forefoot pain is neither known nor previously studied. Nevertheless, wearing ill fitting shoes or shoes of poor quality has been related to the existence of Hallux valgus, lesser toe deformities and foot pain.

Most patients with foot pain that seek medical attention consult their GP. GPs can treat the pain by prescribing pain relief medication, by providing advice (wear better shoes or lose weight) or by referring to other (para)medical specialists like podiatrists or orthopaedic surgeons.

The aim of the main study described in this thesis is study is to investigate the effect of podiatric treatment versus standardised shoe advice on foot pain, foot disability, quality of life and social participation in people aged 50 years and older with hindering forefoot pain in primary care.

Chapter 2 and Chapter 3
A total of 205 patients with forefoot pain who indicated to also have a functional limitation of foot related activities were included for this study. They were randomly allocated to receive podiatric treatment or shoe advice by means of an information leaflet. During a follow-up of 12 months, every 3 months foot pain, foot dysfunction, general health and social participation were assessed with questionnaires.
No difference between the groups was observed in any of the outcome measures. Both groups decreased in foot pain and foot dysfunction equally but did not change in general health or social participation. The results of this study indicate that providing shoe advice and podiatric treatment are equal beneficial for patients who consult their GP with functional limiting forefoot pain. Therefore a GP could start by providing a less costly shoe advice first or ask the podiatrist to do so before fabricating an insole.

Chapter 4
The aims of this study are: (i) to describe general podiatric treatment of patients with forefoot pain and (ii) to evaluate the entire treatment process using an expert panel. Twenty-five participants of the main study (Chapters 2 and 3) participated in this study. A group of experts (a podiatrist, a human movement scientist and an orthopaedic surgeon) evaluated the baseline data and the findings described by the podiatrist and performed a physical examination, on average, 3 months after inclusion.
The expert panel identified two different approaches in establishing aetiology of the podiatrists. Firstly they defined a functional approach in which the podiatrist looks for the cause of the problems by evaluating the kinetic chain and other external factors that might influence the foot pathology. And secondly, a non-functional approach in which the podiatrist evaluates at a more local manner. The heterogeneousness of assessing aetiology may be related to the heterogeneous results established in other studies and may have had an effect on the lack of difference between the interventions described in Chapters 2 and 3.

Chapter 5
The aims of this study are: (i) to determine which shoe characteristics should be included when providing information about footwear for patients with foot pain, (ii) to develop an information leaflet, (iii) to evaluate if women asked to select shoes with the developed leaflet are able to choose better footwear than women who do not have the leaflet.
The content of the information leaflet was based on evidence and professional opinion due to the lack of evidence on the influence of shoe characteristics on foot pain and dysfunction. A leaflet was developed with 9 characteristics; 6 functional and 3 fit characteristics. A total of 59 women with an average age of 69 (range 54-86) were asked to find shoes in a shopping mall that they liked and thought appropriate to walk on for several consecutive hours. Twenty-nine randomised women did so with the help of the information leaflet. The shoes were assessed by two podiatrists who were not aware whether the women had made use of the leaflet. The women using the leaflet were able to choose shoes that were more appropriate according to the leaflet than those without. Thus the leaflet seems to be efficacious.

Chapter 6
The aims of the study described in this chapter are (i) to create a Dutch version of the Manchester Foot Pain and Disability Index (MFPDI) and (ii) to evaluate all measurement properties based on the Classical Test Theory (CTT), including a cross-cultural validation of the Manchester Foot Pain and Disability Index using the Dutch translated version. Foot pain and related dysfunction as described in Chapters 2 and 3 were measured using this questionnaire together with two others. Using the data from this study we assessed measurement properties. The questionnaire is comprised of 3 factors and we concluded that the functional limitations factor is the only factor that is reliable. In the functional limitations sub-scale, no differences have been found that can attributed to language or culture between the Dutch and the UK version of the questionnaire and the scale is valid. Responsiveness is moderate. Based on these findings and other studies the other sub-scales should not be used henceforth and using the functional limitation scale for longitudinal studies should be done with caution.

Chapter 7
The aim of this study was to evaluate the effects of three different positions of the sole flexion point on plantar loading during gait: a sole flexion point right underneath the metatarsal-phalangeal joints MTPJs (control), one proximal to the MTPJs and one underneath the tarso-metatarsal joints. For every conditions the same brand and make shoes were used of which the outer sole was incised until the inner sole was reached. Peak pressure (PP), pressure time integral (PTI) and contact time (CT) were assessed during walking. We did not observe an increase of the variables as hypothesized. However, a decrease of PP, PTI and CT underneath the hindfoot and midfoot was observed with the midfoot sole flexion point. This could indicate that the foot is slipping within the shoe and therefore increasing shear force behind the calcaneus. This study indicates that the location of the sole flexion point does not have to be underneath the MTPJs as previously assumed.

Chapter 8
Based on the studies described in this thesis and the current heterogeneous state of podiatry as seen in our study, providing shoe advice by means of a shoe advice leaflet is an acceptable treatment for forefoot pain in primary care. In a future version of the leaflet the position of the sole flexion point does not have to be as stringently positioned as it is in the current leaflet. Furthermore, use of the MFPDI in future longitudinal studies should be done with caution or an alternative should be developed that is more responsive to change.