

## **Supplement 1**

### **Development of the CIM**

The project management and the project group members, the managers from three medical departments, specialist and nurse managers and physiotherapists from two community healthcare centers, and GPs and nurses from the general practice collaboratively developed the CIM. The health professionals' experience with care for persons with multimorbidity was important information in the development process. Four two-hour cross-sectional meetings with all participants took place to develop the CIM. Further, the project management had meetings with managers in the clinical departments in the hospital, the two community health centers, and GPs and specialists with insight into sharing information through technology.

Evidence identified from the most recent reviews on organizing care in people with multimorbidity was presented to healthcare professionals developing the CIM. The first literature review concluded that the predominant intervention element was a change in the organisation of care delivery, usually through case management or enhanced multidisciplinary teamwork. In six studies, the interventions were predominantly patient-oriented. The effectiveness of the interventions ranged from "low to high certainty".<sup>1,2</sup>

Our own research results regarding care in persons with multimorbidity were also presented to the healthcare professionals developing the CIM.<sup>3-6</sup>

### **The theoretical basis**

The theoretical basis for the CIM intervention relied on the Chronic Care Model (CCM).<sup>7,8</sup> The CCM was known to the healthcare professionals because disease-specific management programs based on the CCM for diabetes, COPD and chronic heart conditions were implemented in the three healthcare sectors.

The target population was people with multimorbidity receiving routine care in general practice for two or more of three conditions; COPD, diabetes (type 1 or type 2) and chronic heart

conditions. In addition, participants had a hospitalization or a visit to an outpatient clinic during the previous year.

The aim of the CIM was to improve quality of care and patient centeredness in persons with multimorbidity.

The organization of the care delivery of the CIM is described in terms of: 1) the clinical focus, 2) organization of care delivery and 3) support for CIM delivery.

1) The clinical focus included shared decision making between the person with multimorbidity and providers supported by motivational interviewing techniques for identifying the patient's goals for care and treatment and developing a care plan in accordance with the goals.<sup>9</sup> Polypharmacy was assessed and addressed by a medication review by a pharmacist.

2) Organization of care delivery was improved for persons with multimorbidity through the following services:

- A. Extended consultations lasting up to 45 minutes and including the GP, the care manager and the person with multimorbidity and, often, a family member
- B. A registered nurse care manager coordinated health services between the three organizations to support integrated care. The care manager also scheduled phone calls and follow-up visits to the GPs office. The number of planned visits to hospital outpatient clinics was reduced to reduce treatment burden when possible and only if specialists and patients agreed.
- C. Increased focus on collaboration between the three sectors to support cross-sectional integration of care

3) Support for delivery was conducted through a two-hour training for healthcare professionals before the start of the study aiming to increase knowledge about multimorbidity, improve skills in team-based care, and provide practical information on CIM procedures and services. The project developed a function in the GP's electronic medical records that supported cross-sectional data sharing of a patient's history, symptoms, test results and the planned pathway between the

sectors using a common data-sharing standard. Remuneration supported extended consultations and the care managers' work in the GP's office.

## References

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3. Schiøtz ML, Høst D, Christensen MB, et al. Quality of care for people with multimorbidity - A case series. *BMC Health Serv Res* 2017; 17: 1–9.
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## Interview guide for patient focus groups

### Introduction round

Name, age, diseases

How did you hear about the project and what considerations did you have to enter the study?

<b>Main themes</b>	<b>Questions</b>	<b>Elaborate questions</b>
The patient information material	<p>Is the information easy to understand?</p> <p>During your first consultation in the project, how was the questionnaire put into use?</p>	<p>What is great and what needs changes in the information material?</p> <p>Where you able to add or change the questions? Did you know what the questionnaire was for?</p>
Clinical changes	<p>Did you choose to transfer any treatments from outpatient hospital clinics to general practice?</p> <p>Where you interested in the proposed rehabilitation courses offered by the municipality health center?</p> <p>Did you wish to have your polypharmacy reviewed by the GP?</p>	<p>Why/why not?</p> <p>Why/why not?</p> <p>Why/why not?</p>
<b>After the intervention</b>		
Effect of the intervention	<p>Did the project make your treatments more comprehensible?</p> <p>Did you experience any influence on your quality of life?</p> <p>How did you experience your last visit to the doctor's office?</p>	<p>What changes have you experienced?</p> <p>Do you have any suggestions for further future improvements?</p> <p>Do you have more to add about suffering from multimorbidity?</p>

## Interview guide for general practice

### Introduction round

**Name, age, diseases.**

How did you hear about the project and what considerations did you have to enter the study?

**The focus is on the practicality of the project.**  
The healthcare professionals were interviewed after the intervention

Main themes	Questions	Elaborate questions
The healthcare information material	Was the material useful and supportive?	
Documentation	How did the documentation part work?	How did you manage the documentation of the first visit and second visit?  How did you manage the completion of documentation?
The feasibility of the project	How did the project work?  How did you experienced the inclusion of patients worked?  How did the preparation of each consultation work? - the use of the questionnaires (relates to the care-manager) - review of journal and patient status (relates to the general practitioners)  How did the longer consultations work? what worked well, what worked less well?  How did the intervention support coherence in the patient process?  How important was it that the inclusion criteria were only 3 established chronic diseases?  What patient feedback have you received?	1. IT list 2. Review of journals 3. telephone calls 4. material of recruitment
The complex intervention for multimorbidity processes	How have you experienced the process?	How did you experience the support and involvement of the project team?  How did you deal with the process in daily life?  How did the telephone follow-

		up work?
Future organisational changes	<p>What needs to change in the future?</p> <p>Have you experienced that the project fitted into everyday life in practice?</p> <p>What are the benefits in getting the municipalities more involved in the collaboration on the patient with multimorbidity and which measures could currently be supportive for the treatment of the multimorbidity?</p> <p>How has time been spent on the project?</p> <p>What role did economic issues played and did it impact on the project?</p>	<p>How much time did the care manager and the general practitioner spent?</p> <p>Have the new collective agreements affected your attitude towards the project?</p>