



AALBORG UNIVERSITY
DENMARK

Aalborg Universitet

Clinical Planning and Coordination Module

From concepts to prototype

Christensen, Anders Skovbo; Vingtoft, Søren; Phanareth, Klaus; Nøhr, Christian

Publication date:
2013

Document Version
Early version, also known as pre-print

[Link to publication from Aalborg University](#)

Citation for published version (APA):

Christensen, A. S., Vingtoft, S., Phanareth, K., & Nøhr, C. (2013). *Clinical Planning and Coordination Module: From concepts to prototype*. Poster presented at Information Technology and Communications in Health, Victoria, Canada.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Clinical Planning and Coordination Module: from concepts to prototype

Anders Skovbo CHRISTENSEN^a, Søren VINGTOFT^a, Klaus PHANARETH^b, and Christian NØHR^c

^aIMT Corporation, Capital Region, Denmark

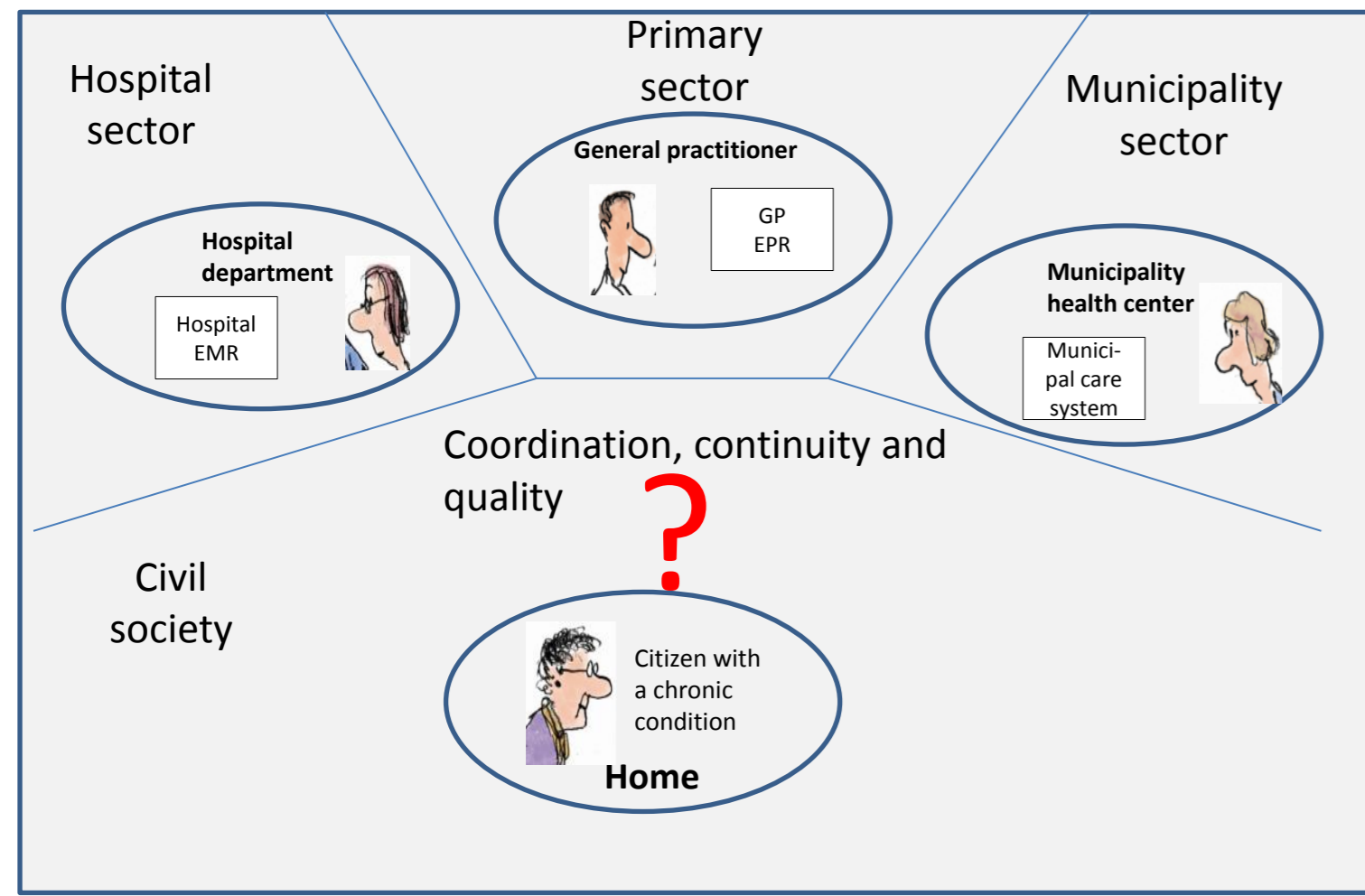
^bFrederiksberg Hospital, University of Copenhagen, Denmark

^cDepartment of Development and Planning, Aalborg University, Denmark

From sector fragmented episodes of care to cross sectorial continuity of care

Today

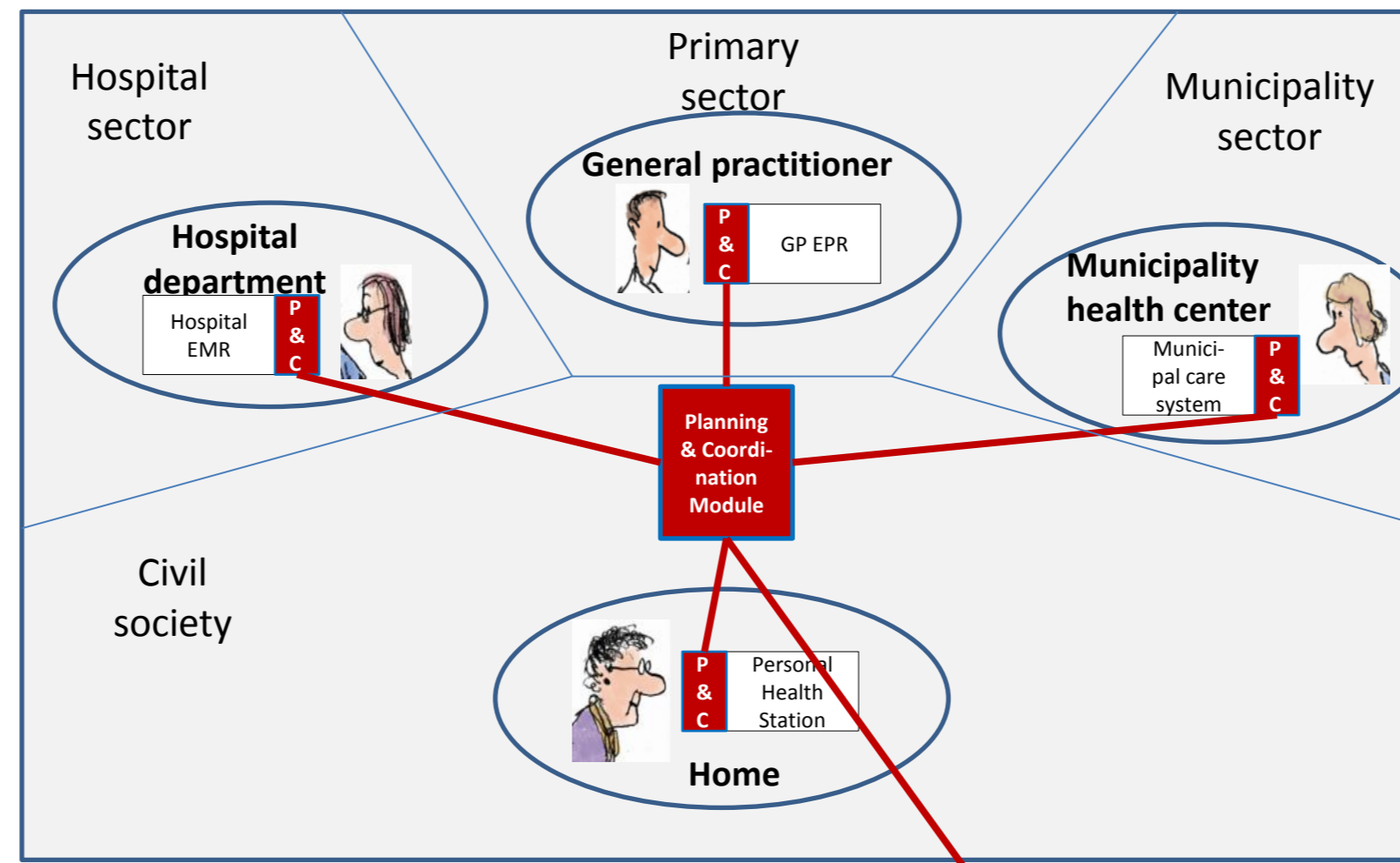
Fragmented healthcare services, no effective coordination



In Denmark, the government in 2010 launched a programme to improve the healthcare of patients with chronic conditions. One of the requirements was to support the “cross sectorial” patient experiences to improve the reported failures of communication and deliver better quality and continuity of care for patients with chronic conditions.

Prototyping

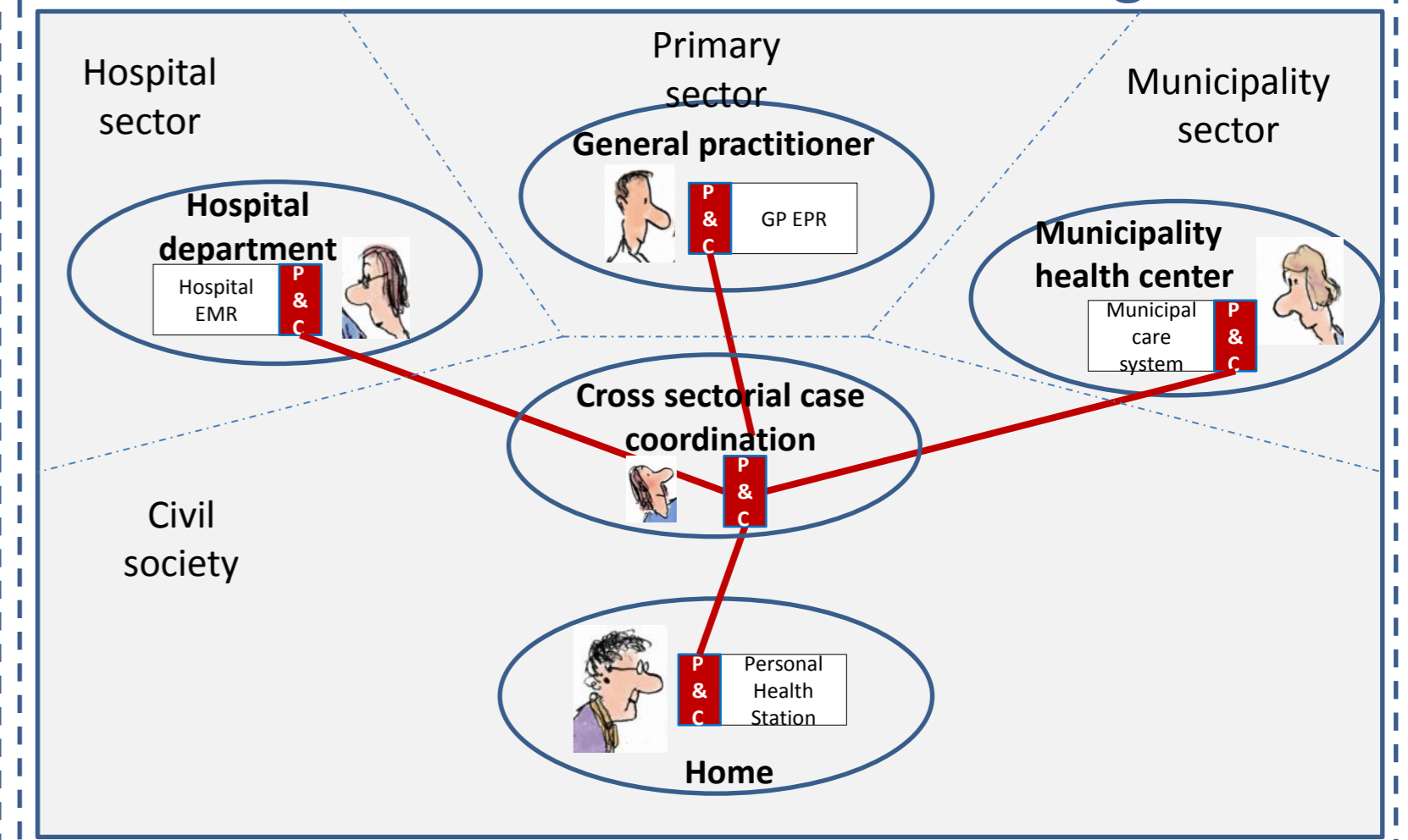
Shared plan provided by the plan & coordination module



As an answer to this programme, a cross sectorial analysis and design group was set up, consisting of clinical specialists, it architects and constructors, from municipality, GP and hospitals. Inspired by the case management and CRM industry and products, the Danish tradition of standardized digital handover protocols for patients transferred between sectors was lifted to the computer-based modeling and implementation of pre-standardized and formulated care management plans by prototyping as a start point for the implementation. The result was a shared individualized plan embedded in the planning and coordination module: “P&C”

Redesign healthcare

New care model implementing coordination, healthcare services and health condition monitoring



The results from the from a clinical simulation study with the P&C prototype¹ identifies opportunities for designing the healthcare organization with embedded coordination functions to support the care processes in particular in relation to chronic conditions like COPD and diabetes. This includes new roles and healthcare business logics based on coordination and continuity in the case management and empowerment of the patients.

The plan & coordination module

Pathways

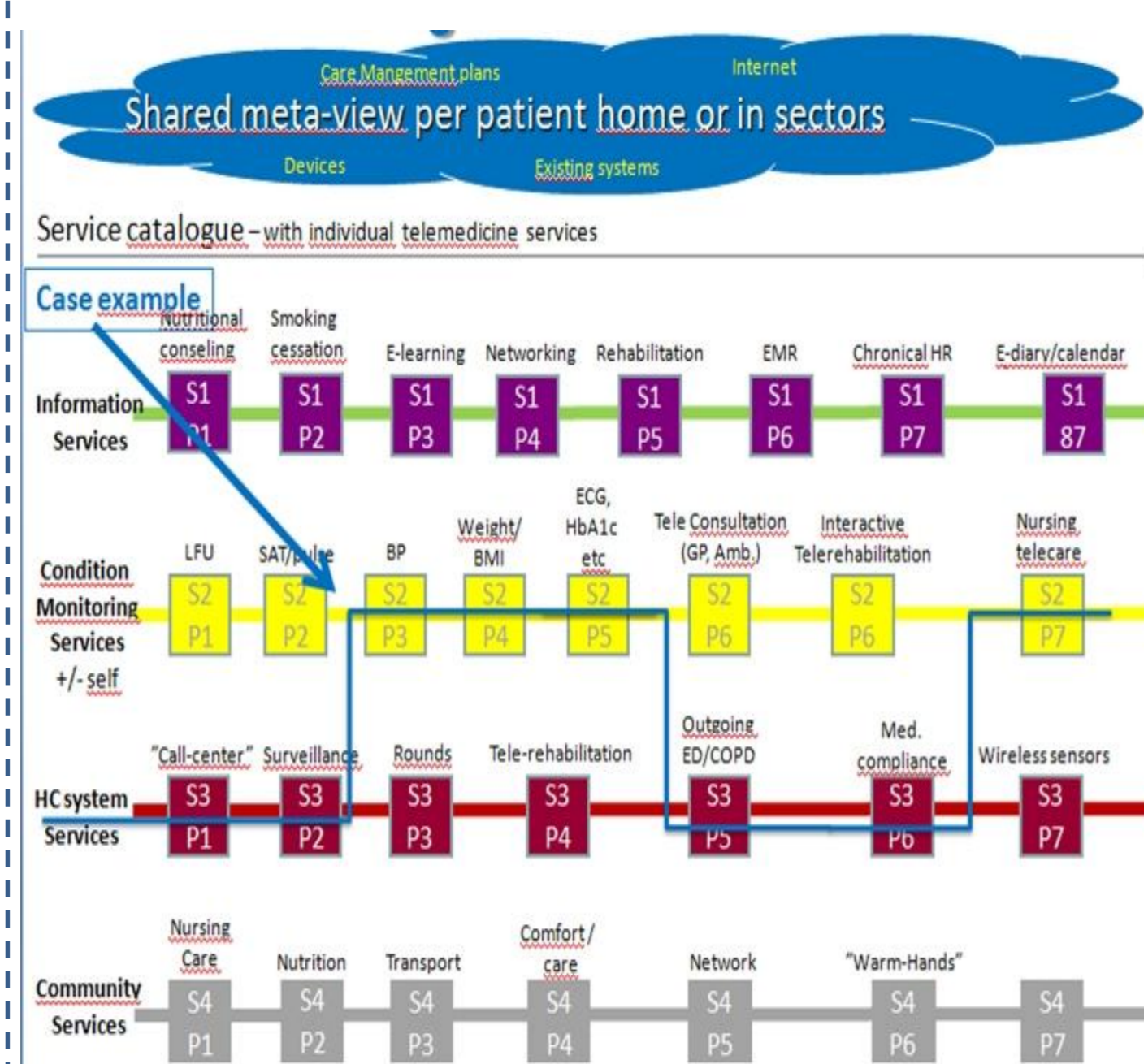
Text based standard pathway and guideline for COPD and diabetes



The Capital Region has developed standard pathways for COPD, Diabetes and other chronic conditions. These pathways are all text based documents, which are difficult to use in clinical practice at the point of care. They serve as reference material for clinical practice for the entire region, including 14 hospitals covering a population of 1.7 mio. citizens, 29 municipalities and 1000 general practitioners.

Health service catalogues

Transforming textbased standard pathways to computable health services



In the project, a model for health services was developed and used in the transformation of the text-based prevention and treatment health services for COPD and Diabetes II pathways into a data object model structure which was implemented, and embedded in an open source SugarCRM toolset

Care Plan

Instantiating, individualizing and maintaining the patients plan

Status	Start Date	End Date	'11	'11	'12	'12
			Qtr. 3	Qtr. 4	Qtr. 1	Qtr. 2
Plan DM2 Stratificering: 1	Niveau 1	19/08/2011 08/09/2013				
Tovholder	PL	19/08/2011 08/09/2013				
Forløb_Debut	Løst	19/08/2011 10/11/2011				
Information til patienten	Løst	19/08/2011 01/09/2011				
Rehabilitering	Løst	19/08/2011 10/11/2011				
Fysisk_Training	Løst	19/08/2011 10/11/2011				
Sygdomsspec_Patientuddannelse	Løst	19/08/2011 10/11/2011				
Rypealvanning1	Alyst af patient	19/08/2011 10/11/2011				
Kostvejledning	Løst	19/08/2011 10/11/2011				
Individual_Vejledning	Optional					
Diabetesstatus	Løst	19/08/2011 01/09/2011				
MedicinStillingtagen	Løst	19/08/2011 10/11/2011				
Komplikationsscreening	Løst	19/08/2011 08/09/2011				
Colloridlets check	Løst	19/08/2011 01/09/2011				
Videreregående_UIS	Optional					
3.måneders-kontrol	Løst	19/11/2011 02/12/2011				
Behandlingsjustering	Løst	19/11/2011 02/12/2011				
Vægt	Løst	19/11/2011 02/12/2011				
HBA1c	Løst	19/11/2011 02/12/2011				
BT	Løst	19/11/2011 02/12/2011				
Egenkontrol	Løst	19/11/2011 02/12/2011				
Rehabilitering_Ad-hoc	Optional					
Intensivt kontrol	Planlagt	19/10/2012 11/04/2012				
6.måneders-kontrol	Hjt. program	19/02/2012 03/03/2012				
9.måneders-kontrol	Hjt. program	19/05/2012 01/06/2012				

The purely clinical plans are instantiated as standard care management programs with patient details, services per stratification level, and leaves room for self-defined optional services. The plan is shown in 3 explodeable tree levels in a Gantt diagram. The services are designed as standard placeholders for concrete services, to be modeled into searchable service catalogues, owned and managed by the different users with the individual providers. A diagram of service states and shifts between them was defined, and made documentable on a per-service manner. These service state shifts are the core formulation of the support of the coordination problem. The care programs are formulated in a manner such that it is possible to concatenate the instantiated plans over multiple health conditions, and the system holds a simulated results window with measurement results stemming from the execution of services

Health Condition

Using data from measurements and monitoring to overview the patients condition

Resultat	12-09-2011	04-04-2012	04-04-2012	04-04-2012	04-04-2012
Diabetes kontrol	1,5	1,5	1,5	1,5	1,5
HBA1c	6,5	6,5	6,5	6,5	6,5
Diabetes kontrol	1,5	1,5	1,5	1,5	1,5
HBA1c	6,5	6,5	6,5	6,5	6,5
Diabetes kontrol	1,5	1,5	1,5	1,5	1,5
HBA1c	6,5	6,5	6,5	6,5	6,5
Diabetes kontrol	1,5	1,5	1,5	1,5	1,5
HBA1c	6,5	6,5	6,5	6,5	6,5
Diabetes kontrol	1,5	1,5	1,5	1,5	1,5
HBA1c	6,5	6,5	6,5	6,5	6,5

Conclusions

This planning and coordination module is a first-of-a-kind in Denmark and represents a “missing link” in the Danish IT infrastructure for healthcare. We have found requirements of such functionality in other literature, but have not been able to find references of a similar running module. The prototype opens up for new concepts in the care models and the healthcare organization including sector neutrality, patient centricity, self control, health service deployment and systemic health proactivity in the context of population management.

References

[1] Sanne Jensen, Søren Vingtoft and Christian Nøhr, “Benefits of a Clinical Planning and Coordination Module: A Simulation Study”, Proceedings ITCH Conference 2013, Victoria, Canada