

Included diagnostic groups

In Operation		Under Development	
⇒ Epilepsy	⇒ Chemotherapy	⇒ IBD	⇒ Hydrocephalus
⇒ Narcolepsy	⇒ Asthma	⇒ Diabetes Type 1	⇒ Cochlear implant
⇒ Sleep apnoea	⇒ COPD	⇒ NIV treatment	⇒ Palliative care
⇒ Rheum. arthritis	⇒ HIV	⇒ Oncology inpatients	⇒ Gynaecologic cancers
⇒ Renal failure	⇒ Heart transplant	⇒ ...	
⇒ Prostate cancer	⇒ Neuromuscular		
⇒ Lung cancer	⇒ Gestational diabetes		
⇒ Breast cancer	⇒ Multiple sclerosis		

Departments: 47, patients: 51,238, questionnaires received: 115,138 (Feb 2018)

Patient groups suited for telePRO follow-up

- ⇒ Outpatient follow-up with many contacts
- ⇒ Clinical assessment primarily relies on information from the patient
- ⇒ A clinical examination is not necessary for the assessment
- ⇒ The patient is capable of answering PRO and understands the principle

About AmbuFlex/WestChronic

The unit has existed since 2007 and has been the leading force for the national introduction of telePRO in Denmark, which was decided upon in 2016. The WestChronic PRO IT system was developed internally and has been maintained since 2004. WestChronic is engaged in PRO research and by February 2018, 3 PhD studies have been completed, 3 are ongoing and 2 are planned to start in 2018.

Selected references

Schougaard LM, Mejdahl CT, Petersen KH, Jessen A, de Thurah A, Sidenius P, Lomborg K, Hjøllund NH. Effect of patient-initiated versus fixed-interval telePRO-based outpatient follow-up: study protocol for a pragmatic randomised controlled study. *BMC Health Serv Res* 2017 Jan 26;17(1):83-017-2015-8.

Thurah A, Stengaard-Pedersen K, Axelsen M, Fredberg U, Schougaard LMV, Hjøllund NHI, Pfeiffer-Jensen M, Laurberg TB, Tarp U, Lomborg K, Maribo T. A Tele-health Follow-up Strategy for Tight Control of Disease Activity in Rheumatoid Arthritis: Results of the Non-inferiority Randomised Controlled Trail (the TeRA study). *Arthritis Care Res (Hoboken)* 2017 May 16.

Mejdahl C, Nielsen BK, Hjøllund NHI, Lomborg K. Use of patient-reported outcomes in outpatient settings as a means of patient involvement and self-management support: a qualitative study of the patient perspective. *I: European Journal for Person Centered Healthcare* 2016; 4: 359-367.

Schougaard LM, Larsen LP, Jessen A, Sidenius P, Dorflinger L, de Thurah A, Hjøllund NH. AmbuFlex: tele-patient-reported outcomes (telePRO) as the basis for follow-up in chronic and malignant diseases. *Qual Life Res* 2016 Mar;25(3):525-534.

Hjøllund NH, Larsen LP, Biering K, Johnsen SP, Riiskjær E, Schougaard LM. Use of patient-reported outcome (PRO) measures at group and patient levels: Experiences from the generic integrated PRO system, WestChronic. *Interact J Med Res.* 2014;3(1):e5.



- A generic web-based system to support flexible outpatient treatment by use of telePRO for clinical decision support

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Outpatient follow-up activity in patients with chronic diseases is steadily increasing and is traditionally organised with fixed scheduled visits. However, a substantial number of visits turn out to be redundant from both the patient's and the clinician's point of view, while there may be little time for patients with actual needs, which furthermore often occurs between the scheduled consultations.

Patient-Reported Outcome measures collected at home (telePRO) may be used to evaluate the needs and wishes for clinical attention. If knowledge of the state of the patient can be provided, resources can be transferred to patients with actual need or wish for a contact.

The aims for AmbuFlex

Quality of care

- Outpatient visits when needed

Patient centeredness

- PRO and patient preferences decide the contact

Resource reallocation

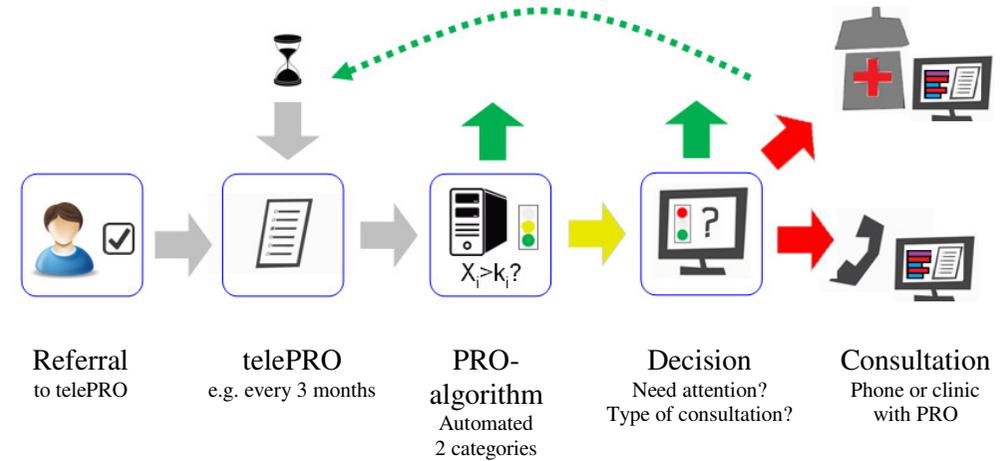
- Prudent use of resources, reduced transportation

Data for group level use

- PRO data for clinical research and quality improvement

AmbuFlex is a generic web-based system which supports flexible outpatient treatment by means of PRO for clinical decision support. Instead of fixed visits, the patients answer questions regarding symptoms, well-being and functional capacity at fixed intervals. Each questionnaire is diagnosis specific and developed for the specific aim of detecting need for clinical attention in that disease as well as for use as a communication tool in the consultation.

The PRO is processed by the AmbuFlex/WestChronic web-server with disease specific algorithms to identify patients definitely without any need of attention (green response, cf. figure) and in that case the system automatically schedules a new questionnaire, e.g. after 3 months.



Need of attention in the rest of the patients (yellow response) is evaluated by a clinician based on PRO and clinical data. A graphical PRO overview is available for the clinician in the Electronic Health Record system. This ensures quick access to a PRO overview together with clinical data regarding the treatment, and constitutes the basis for effective decision support. The same PRO overview is used in the consultation. The patient has access to his/her own PRO overview via the Danish e-health portal (<http://sundhed.dk>).

AmbuFlex/Epilepsi		CPR	Tlf Phone Age					
Mail link.		HISTORY	SETTINGS*	DEMOGRAPHICS	SHOW PRO			
		Th03 maj 12	Th13 nov 12	We12 jun 13	Sa04 jan 14	We06 aug 14	Sa08 aug 15	
Seizures	Overall 12 months	Number of days : 3	Number of days : 0					
	Absences 3 months	Number of days : 0						
	Seizures 3 months	Number of days : 0						
Symptoms	Headache	1	1	1	2	1	1	
	Dizziness	2	2	1	1	1	1	
	Shaking / tremor	2	2	1	2	2	2	
	Double vision	2	1	1	1	1	2	
	Loss of appetite	1	1	1	1	1	1	
	Memory	3	2	3	3	4	4	
	Concentration	4	4	3	4	5	5	
	Aggressiveness	5	3	4	4	5	5	
	Lethargy	3	3	3	4	4	4	
	Sadness	2	2	1	1	2	2	
	Anxiety attach	3	3	3	4	4	4	
	Presence of side effects	3	2	2	2	2	2	
	Eating too much	2	2	2	2	2	2	
	Compliance	Forget medicine	4	4	4	3	2	2
SF-36	General health	4	4	3	4	3	3	
WHO-5	Wellbeing index	64	48	76	48	60	60	
	State of mind / mood	3	3	2	3	3	3	
	Energy	2	3	3	4	2	2	
	Interest	2	4	2	3	2	2	
	Rested	4	5	2	5	5	5	
	Relaxed	3	3	2	3	3	3	
Self-measurement		Kg : 73.5	Kg : 73	Kg : 69	Kg : 74	Kg : 74		