

# **Deployment of Integrated Care Services for Chronic Patients Supported by Information and Communication Technologies**

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Medical and Nursing Direction  
Hospital Clinic  
Barcelona**

# Disclosures

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**No relevant commercial interests**

# Agenda

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- ❑ Healthcare in Catalonia
- ❑ Integral HealthCare area. Barcelona Esquerra
- ❑ Lessons learnt from deployment of Integrated Care
- ❑ Adaptive case management strategies
- ❑ The Nextcare project

# Spain's Autonomous Communities



-Population 2017:46,076,289

-Life expectancy: 79.6 for males and 85.6 for females

# Historical and political context

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- Social Security reform: 1977

*Separation of economic services from healthcare services*

- Catalunya's autonomy statute: 1979

- Decentralization of the state: 1981

*Transfer of responsibility for regional healthcare to the Catalan Autonomous Government*

- National Healthcare system. Universal Coverage

*Progressive change in the Financing system*

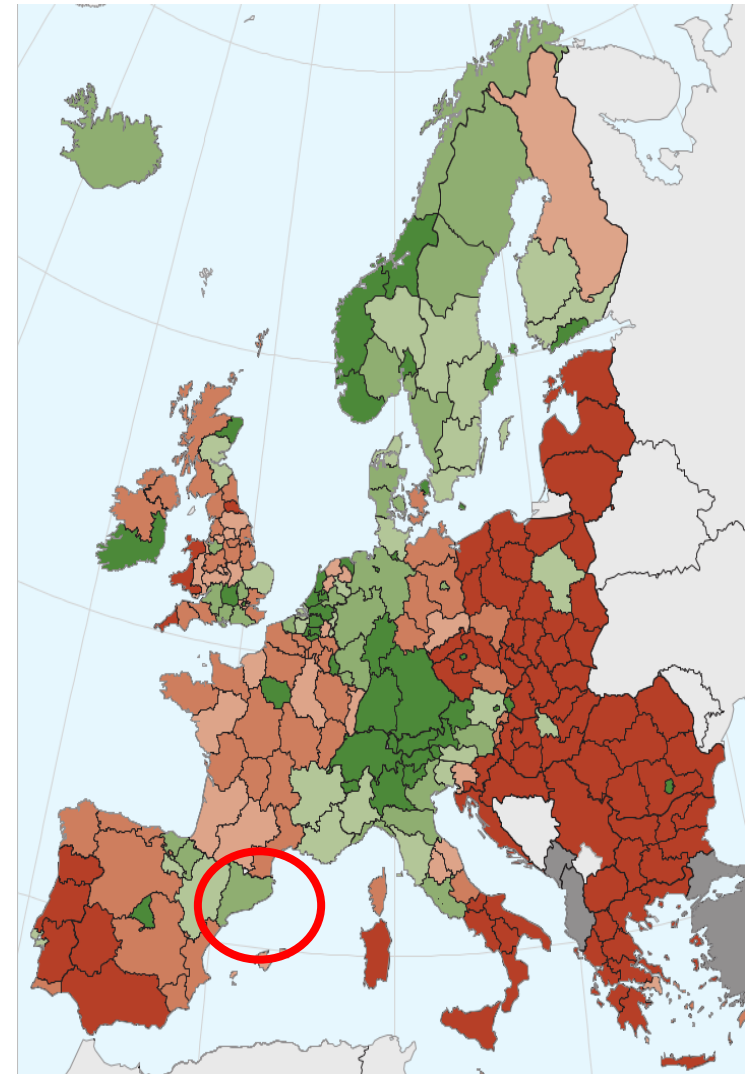
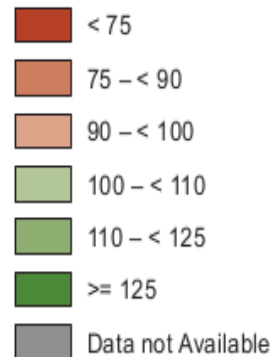
- Catalunya's autonomy statute: 2006

**Catalonia**  
**7.5 million inhabitants**

**GDP 108%**

**Rank 82**

Healthcare system ranks 18



**Gross Domestic Product (GDP) in purchasing power standards per EU regions in % EU28 average= 100**

# Health Plan for Catalonia 2016-2020

Health across all policies



Generalitat de Catalunya  
**Departament de Salut**  
Government of Catalonia  
**Ministry of Health**

## COMMITMENT & PARTICIPATION

1

Persons, their health  
and Health System

2

Healthcare professionals  
involvement

## HEALTH QUALITY

3

Public  
Health

4

Accessibility &  
Performance

5

Drugs &  
Pharmaceutical  
Policy

6

Integrated &  
Chronic Care

7

Health  
Research &  
Innovation

## GOOD GOVERNANCE

8

Excellence  
& Safety

9

Outcomes  
Evaluation &  
Transparency

10

Digital  
Health

11

Territorial  
Integration

## HEALTH ACROSS ALL POLICIES

12

Cross-ministerial and cross-sectoral policies

## PRIORITY AREAS & STRATEGIC PROJECTS

Vulnerable  
infants &  
teenagers

Elderly &  
people with  
disabilities

Mental  
Health

Minority  
Diseases

Communicable  
Diseases

Osteo-  
articular  
System

Respiratory  
System

Vascular  
System

Cancer

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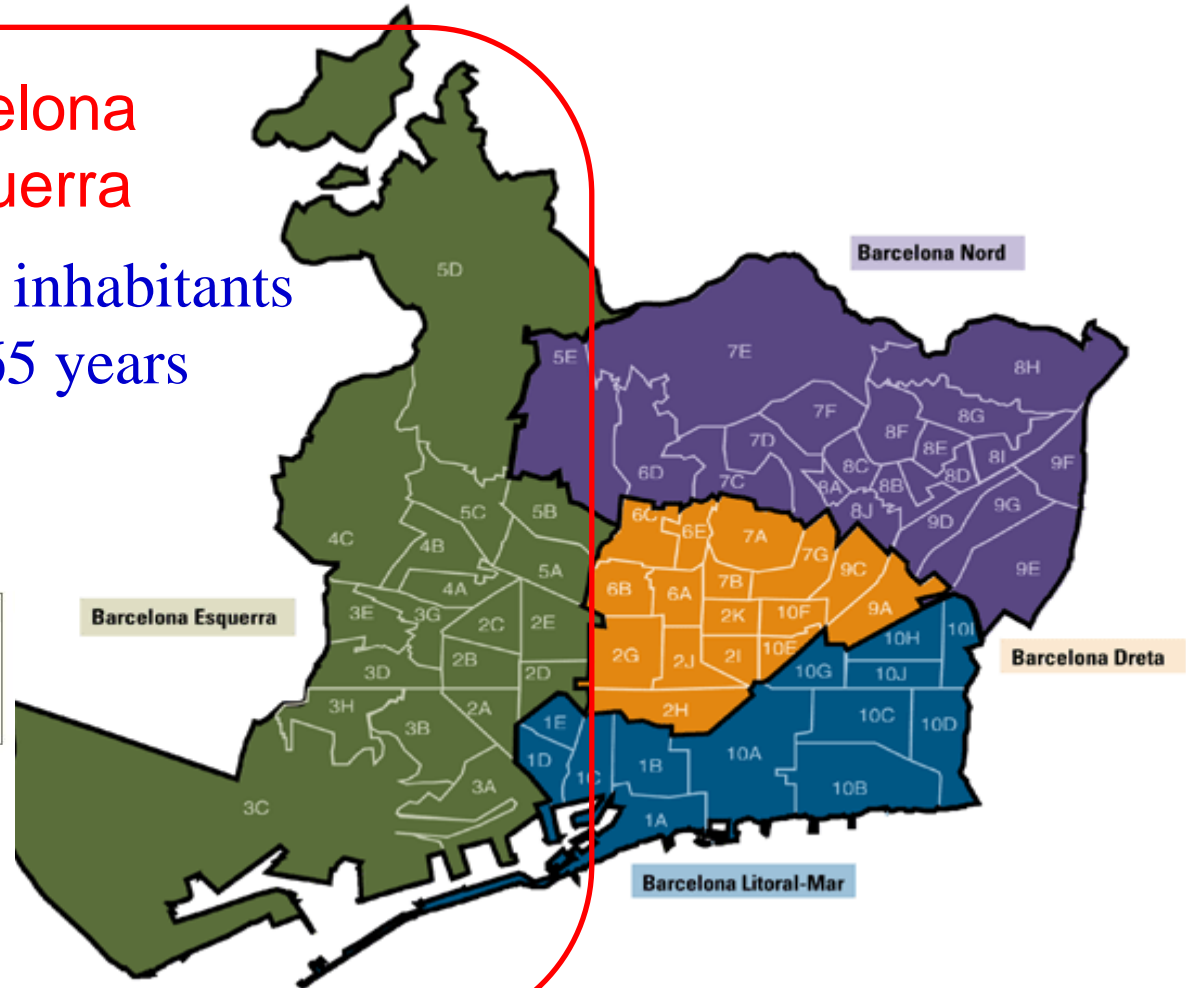


- ❑ Healthcare in Barcelona is provided in the framework of the public health system based on the model of the National Health Service.
- ❑ The organization is structured in four integrated health areas, one of which is the Integrated Health Area of Barcelona Esquerra (*Àrea Integral de Salut de Barcelona Esquerra – AIS-BE*).

# INTEGRAL HEALTHCARE AREA OF BARCELONA ESQUERRA: An example of an Integrated Care System

## Barcelona Esquerra

534.955 inhabitants  
21% > 65 years



### Atenció Primària:

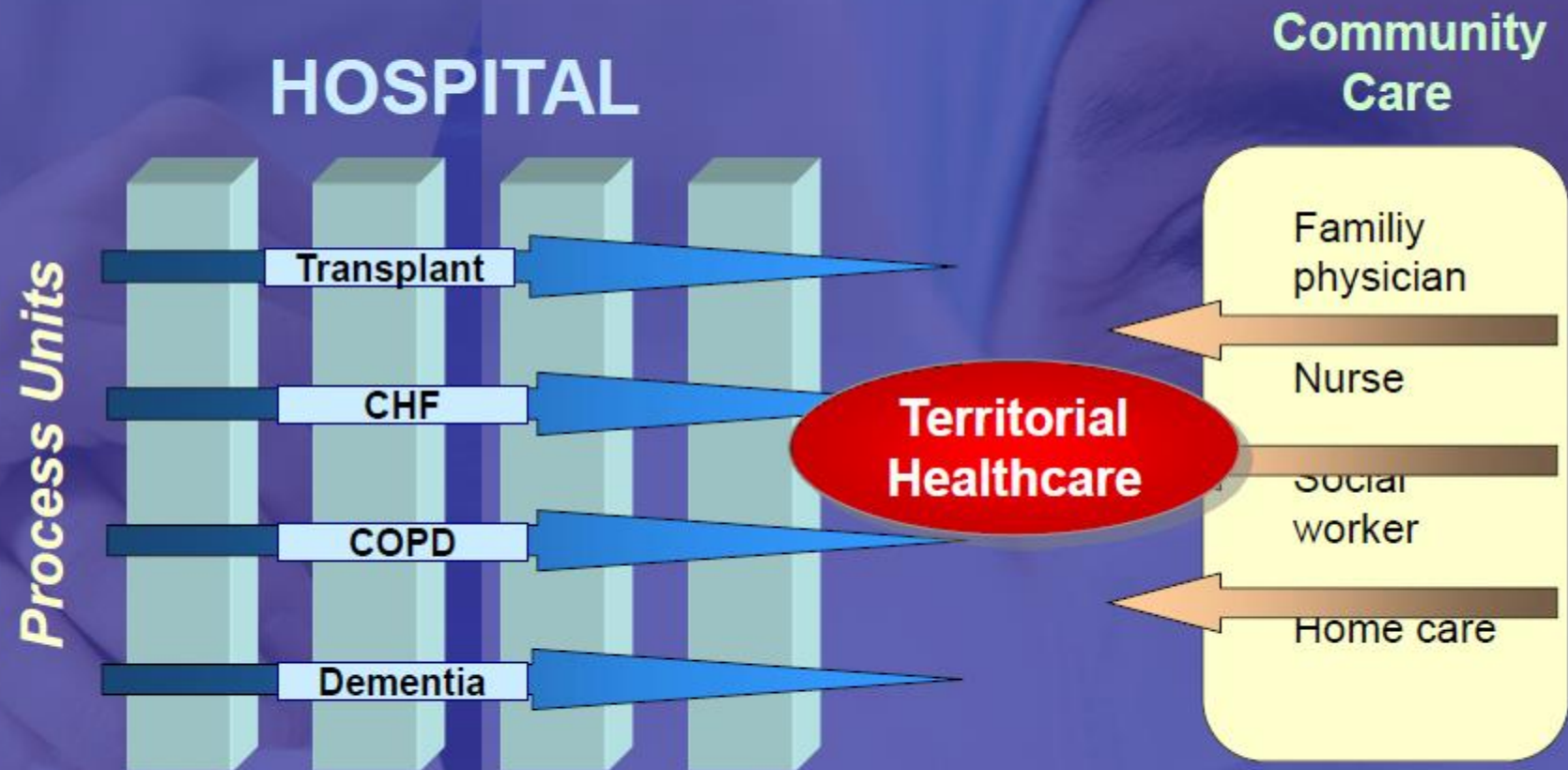


### Atenció Hospitalària



19 Primary Care Teams  
4 Hospitals

# Hospital vs Territorial Healthcare



# Organisational model

**Territorial Health Care Commission  
Barcelona Esquerra**

**Institutions**

**Permanent Commission**

**Technical  
Secretariat**

Cardiology processes

Endocrinological processes

Mental health processes

Vascular processes

Accidents & Emergency

Social-healthcare

Healthcare transport

Poor patient coordination

Pharmacy

**Operating Committees**

# Organisational model

- **Deployment Clinical Groups, over 150 meetings a year and involving about 400 professionals.**

<ul style="list-style-type: none"><li>➤ <b>Reordering Specialized Care (RAE):</b></li></ul>	<ul style="list-style-type: none"><li>➤ <b>Emergencies</b></li><li>➤ <b>Sanitary Transport</b></li><li>➤ <b>Mental Health</b></li><li>➤ <b>Information Systems</b></li><li>➤ <b>Pharmacy</b></li><li>➤ <b>Pain</b></li><li>➤ <b>Pediatric Care</b></li><li>➤ <b>Chronic Disease Care</b></li><li>➤ <b>Oncology</b></li><li>➤ <b>Epidemiological Surveillance</b></li><li>➤ <b>Tropical Diseases</b></li><li>➤ <b>Sexually Transmitted Infections</b></li></ul>
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- ❖ **Vascular Surgery**

- ❖ **General Surgery**

- ❖ **Endocrinology**

- ❖ **Cardiology**

- ❖ **Pneumology**

- ❖ **Dermatology**

- ❖ **Neurology**

- ❖ **Gastroenterology**

# Agenda

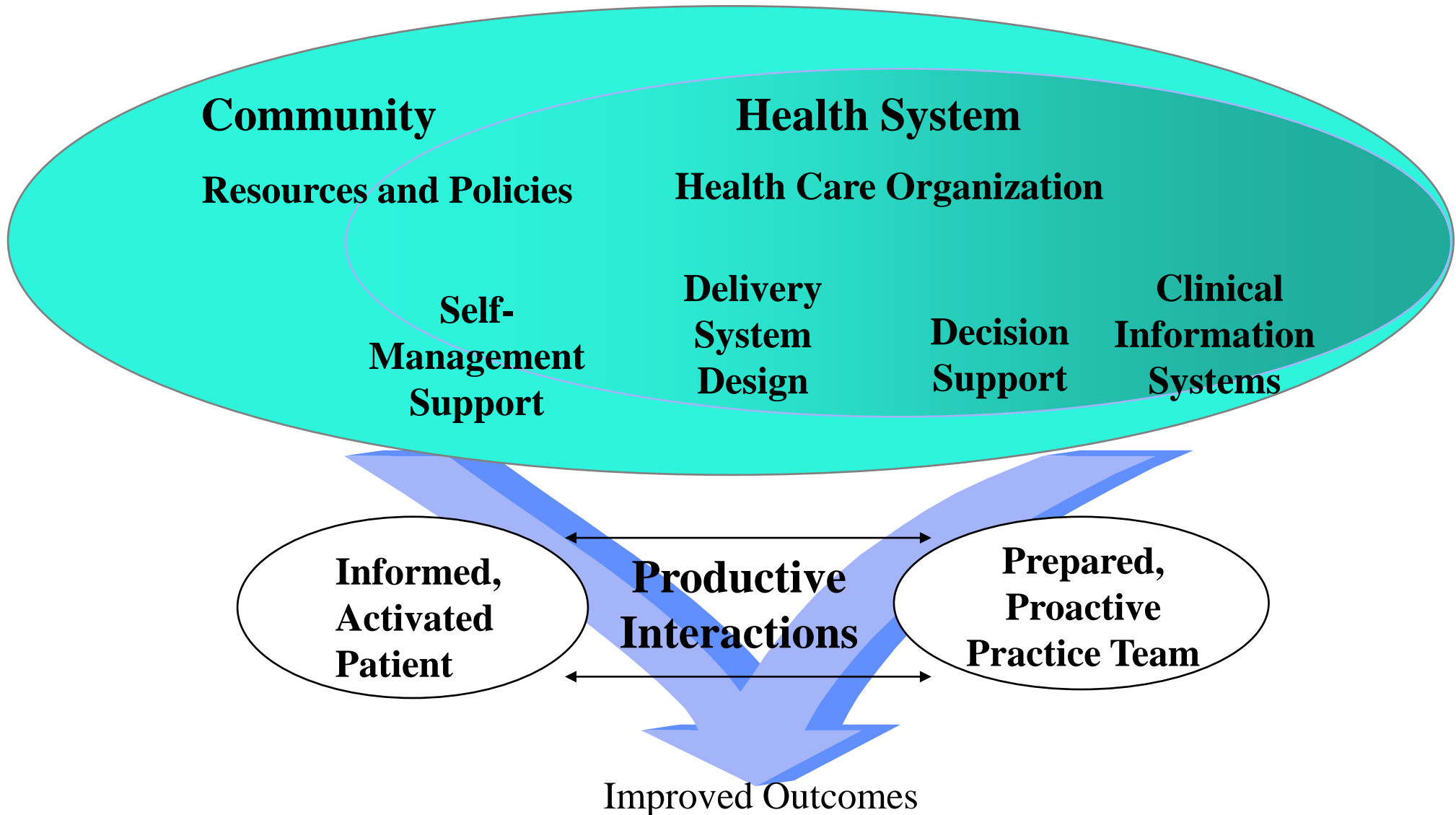
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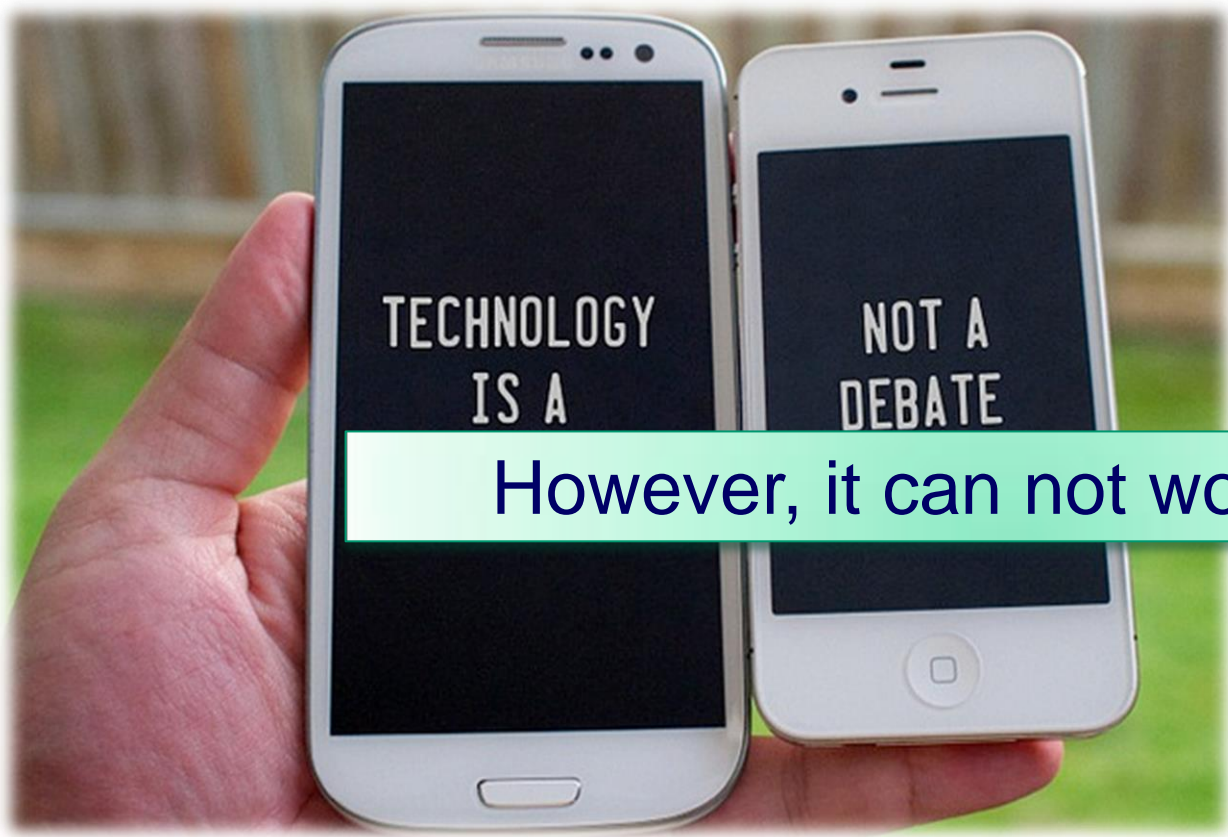
# Chronic Care Model

*World Health Organization – Innovative Care for Chronic Conditions – 2002*

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However, it can not work alone



*Cochrane Database of Systematic Reviews 2015, Issue 9. Art. No.: CD002098*

*Telemedicine in COPD: time to pause. Goldstein RS, et al. Chest.2014 May;145(5):945-9.*

*Effectiveness of telemonitoring integrated into existing clinical services on hospital admission for exacerbation of chronic obstructive pulmonary disease: researcher blind, multicentre, randomised controlled trial. Pinnock H, et al. BMJ, 2013, Oct 17;347:f6070*



# Integrated Care Services are the core component of the care model for chronic patients

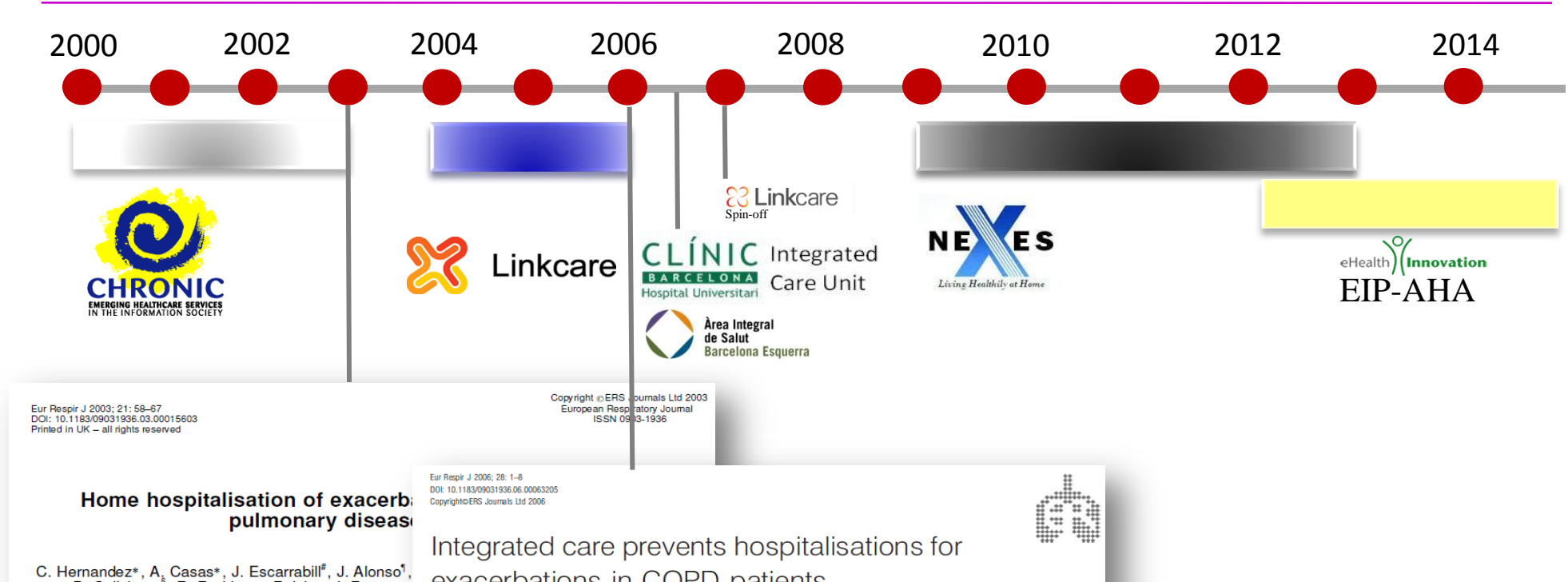
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An Integrated Care Service is an articulated set of standardized actions aiming at covering the patient's health needs, taking into account his/her environment and conditions

- ✓ Patient-centered, not necessarily disease-centered
- ✓ Designed to achieve target health goals within a comprehensive plan for the patient. Based on process design with a longitudinal approach which duration varies for each service
- ✓ A patient can be assigned to one or more integrated care services

# Design and assessment of Integrated Care Services

*historical evolution of the research team*



## Assessment of deployment of 4 Integrated Care Services

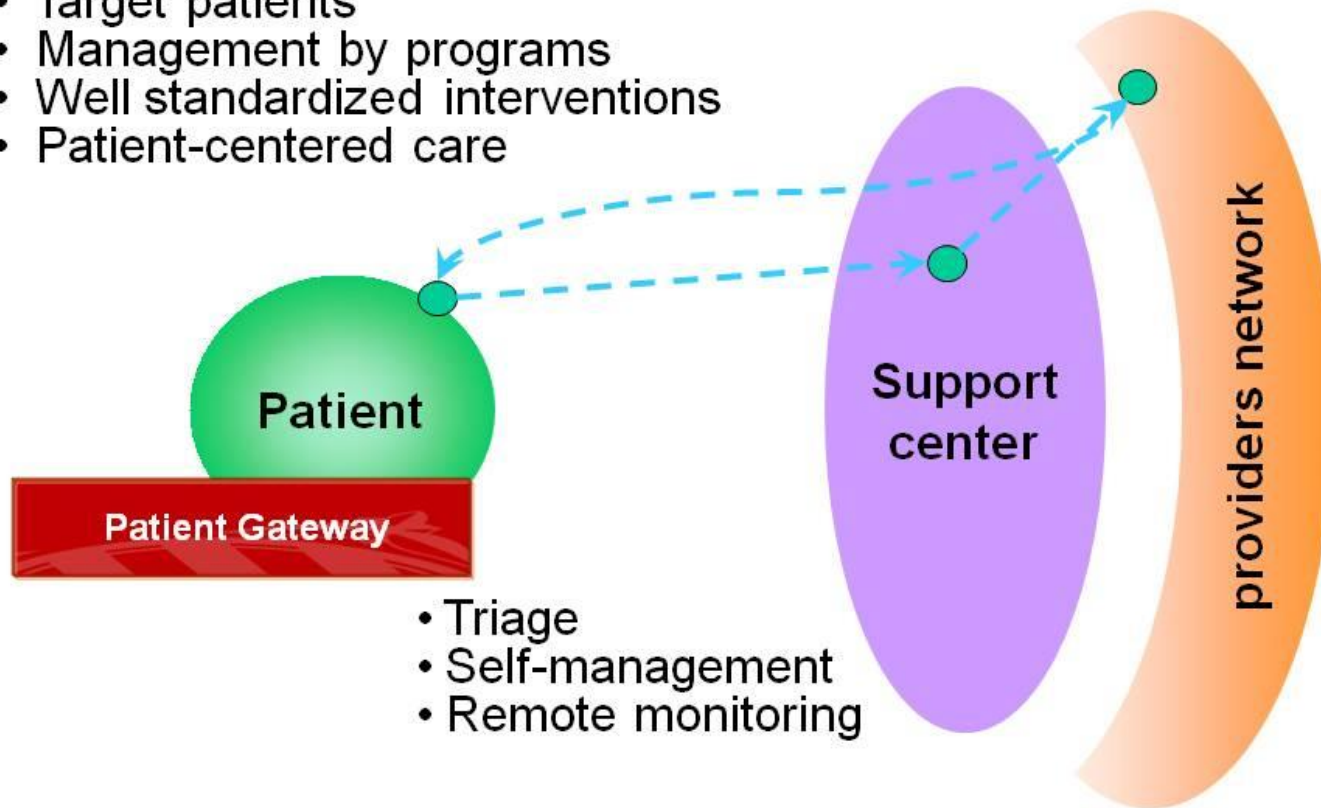
- ✓ Welness and rehabilitation
- ✓ Enhanced care for frail patients
- ✓ Home hospitalization
- ✓ Remote support for diagnosis



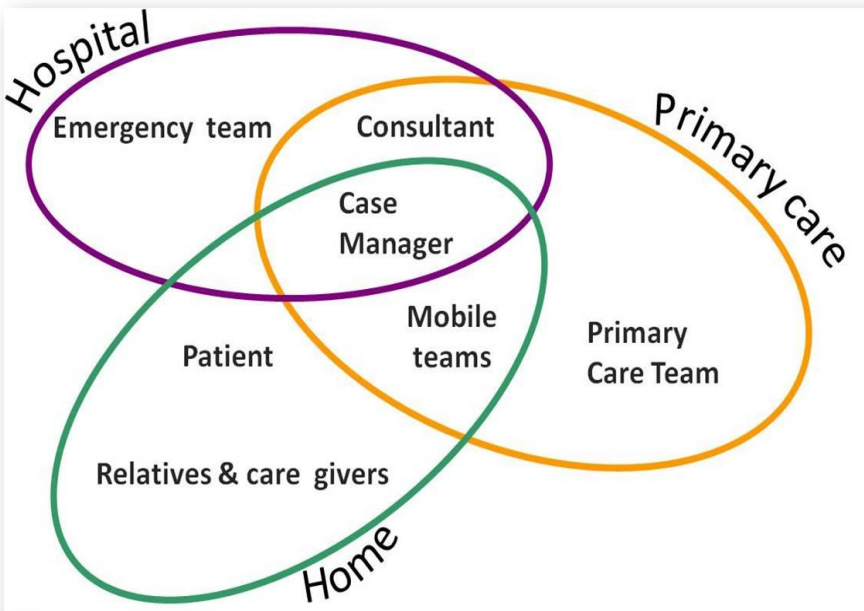
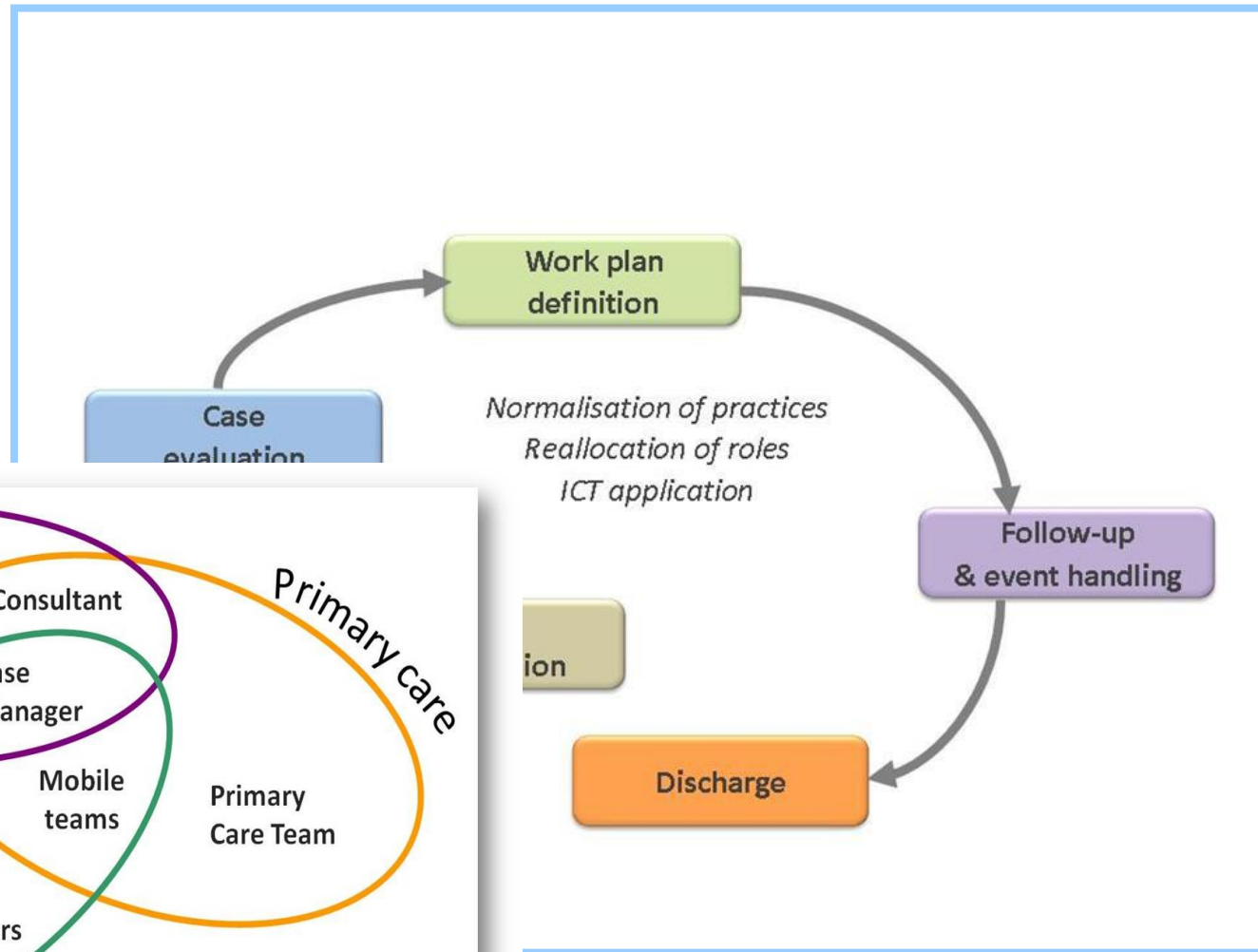
# Deployment of the Integrated Care Model

## Service model

- Target patients
- Management by programs
- Well standardized interventions
- Patient-centered care



# Deployment of the Integrated Care Model



**Home Hospitalization/Early Discharge**

**Transitional Care**

**Patients with complex medical  
conditions**

# Home Hospitalization/Early Discharge Definition

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- ☐ We defined Home Hospitalization/Early Discharge as a service providing acute, home-based, short-term complex interventions aiming at fully (Home Hospitalization) or partially (Early Discharge) substituting conventional hospitalization.
- ☐ The service was delivered by trained hospital personnel for a period of time that should not be longer than the expected length of hospital stay for the patient's diagnostic related groups involved.
- ☐ The Hospital retained clinical, fiscal, and legal responsibility for the pharmaceutical input, medical supervision, and nursing care of the hospital at the patient's home.

## Hospital at Home: Feasibility and Outcomes of a Program To Provide Hospital-Level Care at Home for Acutely Ill Older Patients

Bruce Leff, MD; Lynda Burton, ScD; Scott L. Mader, MD; Bruce Naughton, MD; Jeffrey Burl, MD; Sharon K. Inouye, MD, MPH; William B. Greenough III, MD; Susan Guido, RN; Christopher Langston, PhD; Kevin D. Frick, PhD; Donald Steinwachs, PhD; and John R. Burton, MD

*Ann Intern Med* 2005;143:798-808

Eur Respir J. 2003 Jan;21(1):58-67.

### **Home hospitalisation of exacerbated chronic obstructive pulmonary disease patients.**

Hernandez C, Casas A, Escarrabill J, Alonso J, Puig-Junoy J, Farrero E, Vilaqut G, Collvinent B, Rodriquez-Roisin R, Roca J; CHRONIC project.  
Servei de Pneumologia (ICPCT), Hospital Clinic, IDIBAPS, Barcelona, Spain.

Segura

Coste efectiva en grupos de pacientes  
seleccionados

Influye el tipo de intervención y los  
profesionales involucrados

QUALITY ACUTE CARE FOR OLDER ADULTS

## Hospital Care in the Comfort of Home



How Does Hospital at Home Work?

Is Your Organization Ready for Hospital at Home?

Hospital at Home Toolkit

Hospital at Home® provides safe, high-quality, hospital-level care to older adults in the comfort of their own homes.



## Hospital in the Home

The Hospital in the Home (HITH) service provides hospital-level care for patients in their home environment. It is a safe and efficient substitution for acute in-hospital care for a wide range of conditions.



**Medicine Matters:** Stories of wellness, collaboration and innovation

Home	Healthy	Cardiology	Inside	School	Research
Global Health					

## New Program to Provide Hospital-Level Care at Home



# La reforma del Modelo desde la perspectiva Hospital

## The Ironic Business Case For Chronic Care In The Acute Care Setting

Patients with chronic illnesses already have an impact on the financial health of hospitals—and that impact is growing.

by Albert L. Siu, Lynn H. Spragens, Sharon K. Inouye, R. Sean Morrison, and **Bruce Leff**

*Health Affairs* 28, n° 1 (2009):113-125; 10-1377

By Bruce Leff, Lynn H. Spragens, Barbara Morano, Jennifer Powell, Terri Bickert, Christy Bond, Peter DeGolia, Michael Malone, Catherine Glew, Sindy McCrystle, Kyle Allen, and Albert L. Siu

### INNOVATION PROFILE

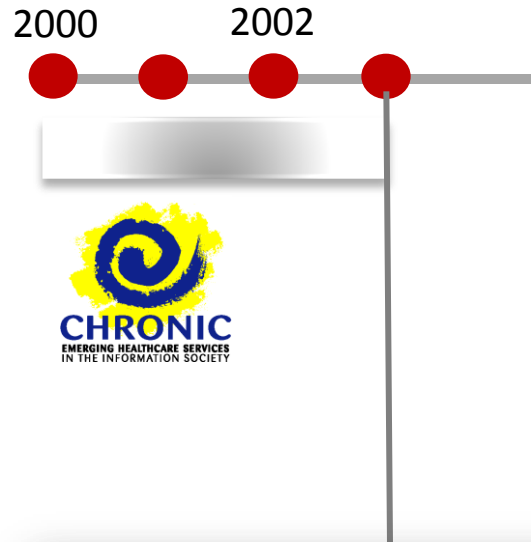
## Rapid Reengineering Of Acute Medical Care For Medicare Beneficiaries: The Medicare Innovations Collaborative

*Health Affairs* 31, n°6 (2012):1204-1215

### Portafolio services:

- Day hospital
- Short stay unit
- Hospital at home
- Transitional care
- Home care (long term)
- Paliative Care
- Nursing home
- Etc..

# Assessment of home hospitalization and early discharge at the Hospital Clinic of Barcelona



Eur Respir J 2003; 21: 58-67  
DOI: 10.1183/09031536.03.00015603  
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European Respiratory Journal  
ISSN 0903-1536

## Home hospitalisation of exacerbated chronic obstructive pulmonary disease patients

C. Hernandez\*, A. Casas\*, J. Escarabill\*, J. Alonso\*, J. Puig-Junoy\*, E. Farrero\*, G. Vilagut\*, B. Collvinent\*, R. Rodriguez-Roisin\*, J. Roca\*, and partners of the CHRONIC project

*Home hospitalisation of exacerbated chronic obstructive pulmonary disease patients. C. Hernandez, A. Casas, J. Escarabill, J. Alonso, J. Puig-Junoy, E. Farrero, G. Vilagut, B. Collvinent, R. Rodriguez-Roisin, J. Roca, and partners of the CHRONIC project. ©ERS Journals Ltd 2003.*

**ABSTRACT:** It was postulated that home hospitalisation (HH) of selected chronic obstructive pulmonary disease (COPD) exacerbations admitted at the emergency room (ER) could facilitate a better outcome than conventional hospitalisation.

To this end, 222 COPD patients (3.2% female; 71±10 yrs (mean±SD)) were randomly assigned to HH (n=121) or conventional care (n=101). During HH, integrated care was delivered by a specialised nurse with the patient's free-phone access to the nurse ensured for an 8-week follow-up period.

Mortality (HH: 4.1%; controls: 6.9%) and hospital readmissions (HH: 0.24±0.57; controls: 0.38±0.70) were similar in both groups. However, at the end of the follow-up period, HH patients showed: 1) a lower rate of ER visits (0.13±0.43 versus 0.31±0.62);

\*Servei de Pneumologia (ICPCT) and Servei d'Urgències, Hospital Clinic, IDIBAPS. \*UFISS-Respiratoria (Servei de Pneumologia), Hospital Universitari de Bellvitge, Universitat de Barcelona. \*Health Services Research Unit, Institut Municipal d'Investigació Mèdica (IMIM-IMAS) and \*Research Center for Health and Economics (CRES), Universitat Pompeu Fabra, Barcelona, Spain.

Correspondence: J. Roca, Servei de Pneumologia, Hospital Clinic, Villarroel 170, Barcelona 08036, Spain.  
Fax: 34 932275455  
E-mail: jroca@clinic.ub.es

**Objective** – To evaluate implementation and 10 years follow-up of Home Hospitalization (HH) and Early Discharge (ED) as an ICS into an urban healthcare district in Barcelona (ES).

**Design** –Prospective study with pragmatic assessment of the deployment of HH/ED. Setting and patients: Surgical and medical acute and exacerbated chronic patients requiring admission into a highly specialized hospital (Hospital Clinic).

**Area - Barcelona – Esquerra. Period 2006-2015**

**Intervention** – Home hospitalization for a period equivalent to the hospital stay for the DRG. Integrated care intervention

**Target variables** – Reduction of days of in-hospital hospital stay, early readmissions, visits to emergency department, 30-day mortality, costs

# Assessment of home hospitalization and early discharge at the Hospital Clinic of Barcelona

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- ✓ **Safe and effective** – for acute and chronic patients. Average savings of 5 in-hospital days per patient. Early readmissions 10%; mortality 0.3% during admission and 2% at 30 days post-discharge

Increased complexity over time with identical outcomes

- ✓ **Synergies** – High potential for coordination with other integrated care services for chronic patients
- ✓ High degree of satisfaction of both patients and families
- ✓ Initial resistance in hospital staff and primary care professionals that decreased through the implementation period

- ✓ **Sustainability** – Cost reduction at health system level and acceptable balance for the provider

## Objective 3

# Assessment of home hospitalization and early discharge at the Hospital Clinic of Barcelona

## Contributions

- ✓ Safe and cost-effective alternative to conventional hospitalization for properly assessed patients
- ✓ It requires highly prepared personnel
- ✓ The building blocks strategy for deployment allowed increase of complexity over time
- ✓ It should be considered in the portfolio of integrated care because of its potential for synergies with other services

## Strenghts and limitations

- ✓ Development and assessment as a real world service
- ✓ Low level of academic evidence because of the study design

## Future areas of development

- ✓ Generalization and expansion of the service
- ✓ Adaptation to community based integrated care services
- ✓ Innovation of the service at tertiary hospital level
- ✓ Implementation of reimbursement modalities generating incentives

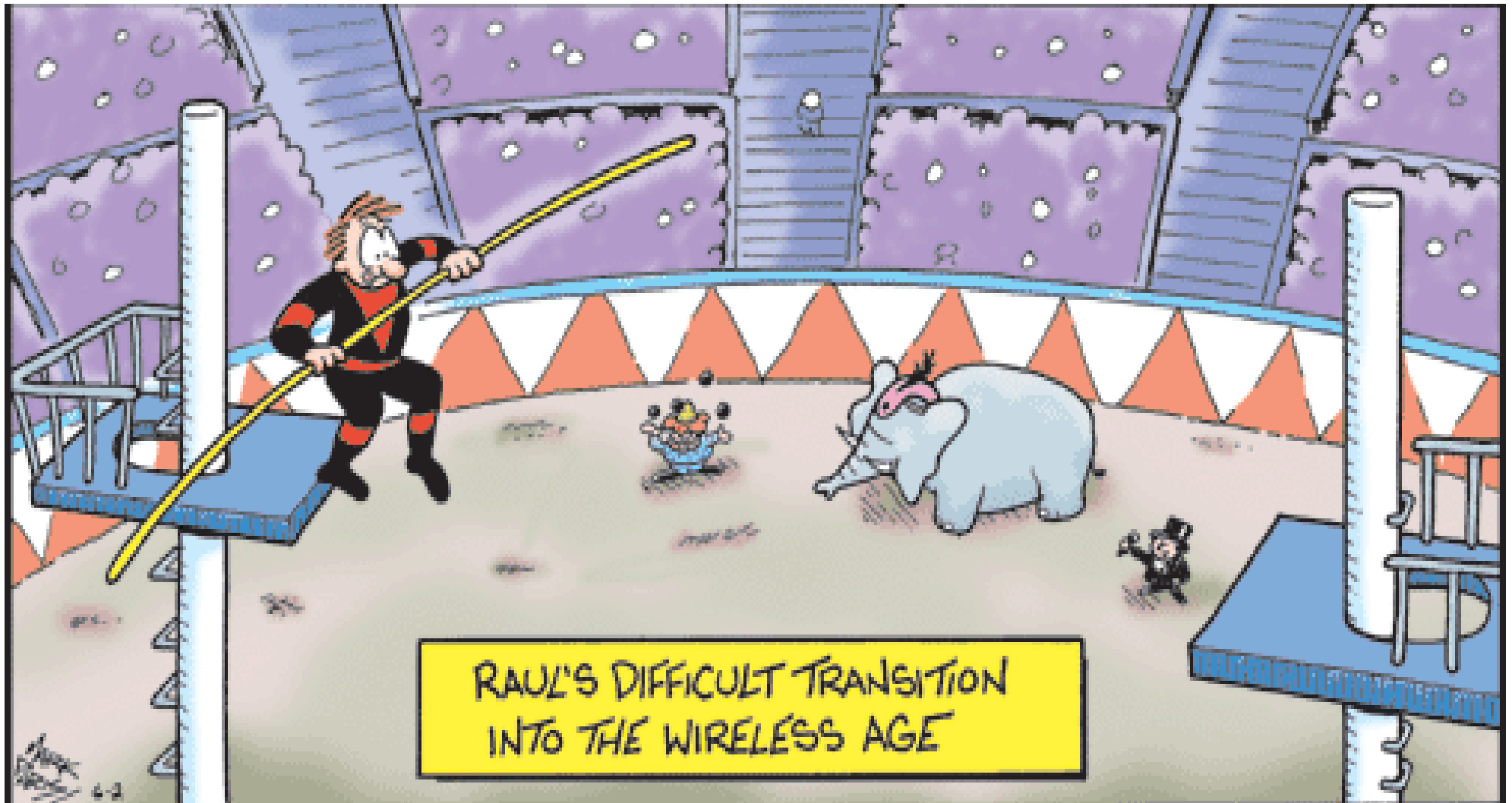
# **Transitional Care**

**Patients with complex medical  
conditions**

# Transitional Care

***Transitional care*** – range of *time limited* services and environments that *complement others interventions* and are designed to ensure health care continuity and avoid preventable poor outcomes among *at risk* populations as they move from one level of care to another, among multiple providers and across settings.

# Transition can be challenging





2/10/11 ②

PAT RUTHERFORD

# IMPROVING TRANSITIONS and REDUCING AVOIDABLE REHOSPITALIZATIONS

NOT JUST IN  
the SAME  
HOSPITAL

HI

GATE-KEEPERS  
NO COMMON RECORDS

PATIENT is the COORDINATOR of CARE

CARE is LOCATION or PROCESS-CENTERED - NOT PATIENT-CENTERED

FREQUENT COSTLY AVOIDABLE

The PATIENT

INPATIENT HOME CARE COMM. CARE SPEC. CARE OUTPAT. CARE

The SPECTRUM of CARE

THERE IS NO ONE SOLUTION

AVOIDABLE COSTS

HEALTHCARE REFORM PROVISIONS

1% PENALTY ON ALL CMS PAYMENTS for POOR PERFORMANCE

EXECUTIVE LEADERS

Priorities? Metrics?

AMI CHF PNEUMONIA

STATE ACTION AVOIDABLE REHOSPITALIZATIONS INITIATIVE

CRISIS = DANGER + OPPORTUNITY

The SNAKE EFFECT  
VARYING DEGREES of WILL

STRATEGIC GOAL PENALTY AVOIDANCE WATCH + WAIT

HOSPITALS • PHYSICIANS • AGENCIES ON ACTING  
HOME CARE NURSING FAC.

FINANCIAL INCENTIVES

SYSTEMIC BARRIERS  
LEADERSHIP



the "BILLION-DOLLAR U-TURN"

NEED METRICS

WHAT are the HIGH-LEVERAGE CHANGES?

WHICH ONES are SCALABLE?

WHAT INFO DOES a CROSS-CONTINUUM TEAM'S DIAGNOSTIC REVIEWS PROVIDER NEED?

COMPREHENSIVE PICTURE

Jim Nittle / ALPHACHIMP Studio



# Evidence-based Models

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- ❑ Care Transitions Intervention<sup>SM</sup>
- ❑ Transitional Care Model
- ❑ Bridge Program
- ❑ BOOST (Better Outcomes for Older Adults through Safe Transitions)
- ❑ GRACE (Geriatric Resources for Assessment and Care of Elders)
- ❑ Guided Care®

*Naylor M, et al. Transitional care. Am J Nurs 2008; 108(9 Suppl):58-63;*

*Coleman EA, et al: The Care Transitions Intervention: results of a randomized controlled trial. Archives of Internal Medicine, 2006;166(17):1822-1828, Crossing the Quality Chasm: A New Health System for the 21st Century. 2001*

# Mejorar las transiciones es un proceso complicado y multifactorial

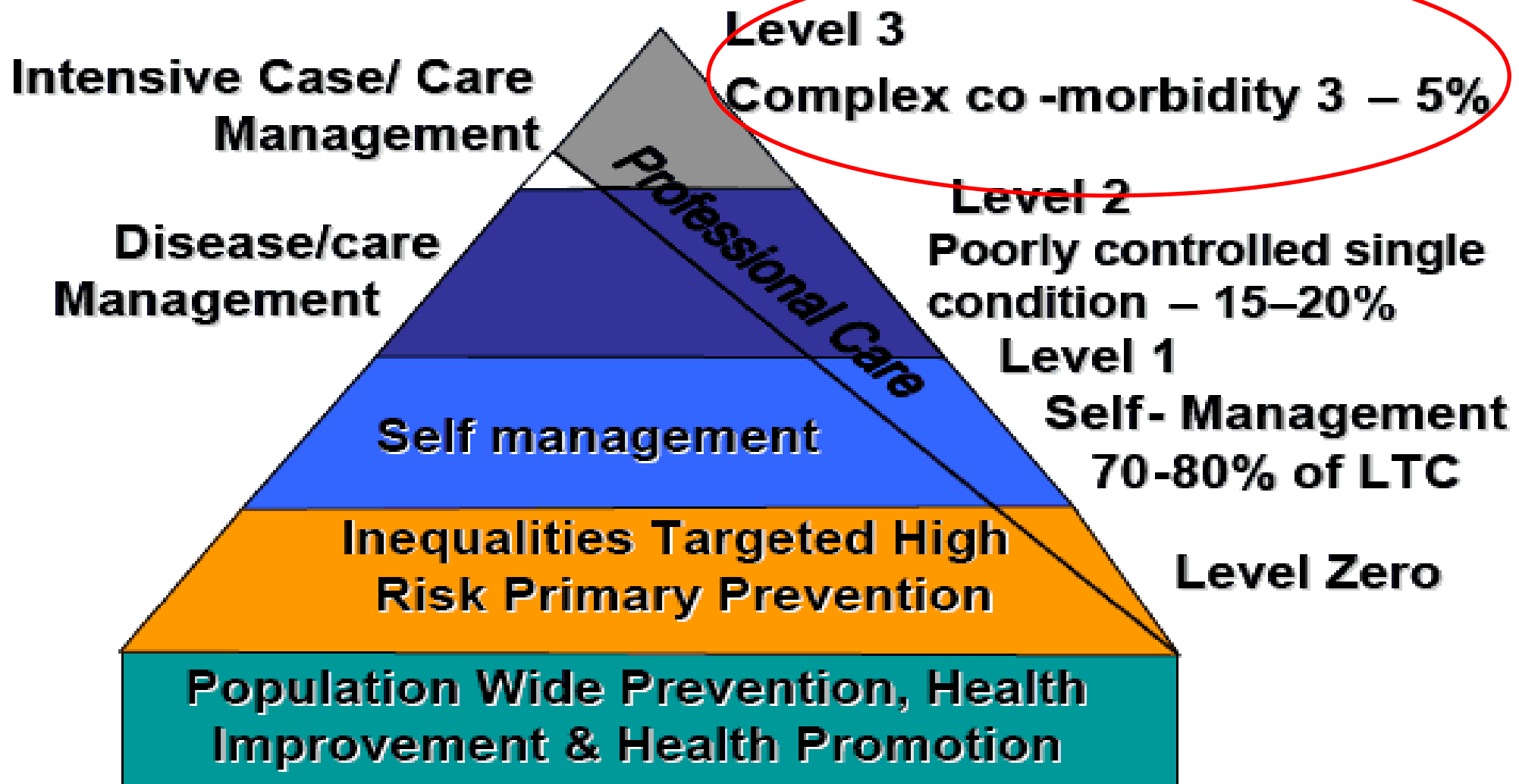
## Naylor et al

- ✓ Una única intervención no es útil y cada paciente puede necesitar la combinación de varias actuaciones y estas pueden cambiar a lo largo del tiempo.
- ✓ Hacer mucho por muy poco tiempo tiene poco impacto en el sistema.
- ✓ Cambios importantes centrándose en la eficiencia, seguridad, confort y la

## Coleman EA et al



# Modelo de provisión. Marco organizativo y funcional



## Intervention unplanned hos

a series of sys

Funded by National Inst  
Research for Patient Ben

Sarah Purdy, U  
Shantini Paranjot  
Alyson Huntley,  
Rebecca Thoma  
Mala Mann, C  
Dyfed Huws, Cardiff University  
Peter Brindle, NHS Bristol  
Glyn Elwyn, Cardiff University

**Final Report**  
**June 2012**



## Preventing admission of older people to hospital

der" people in the community reduces admissions

medicine for older people, Sunku Guptha consultant physician,

BMJ 2013;346:f3186

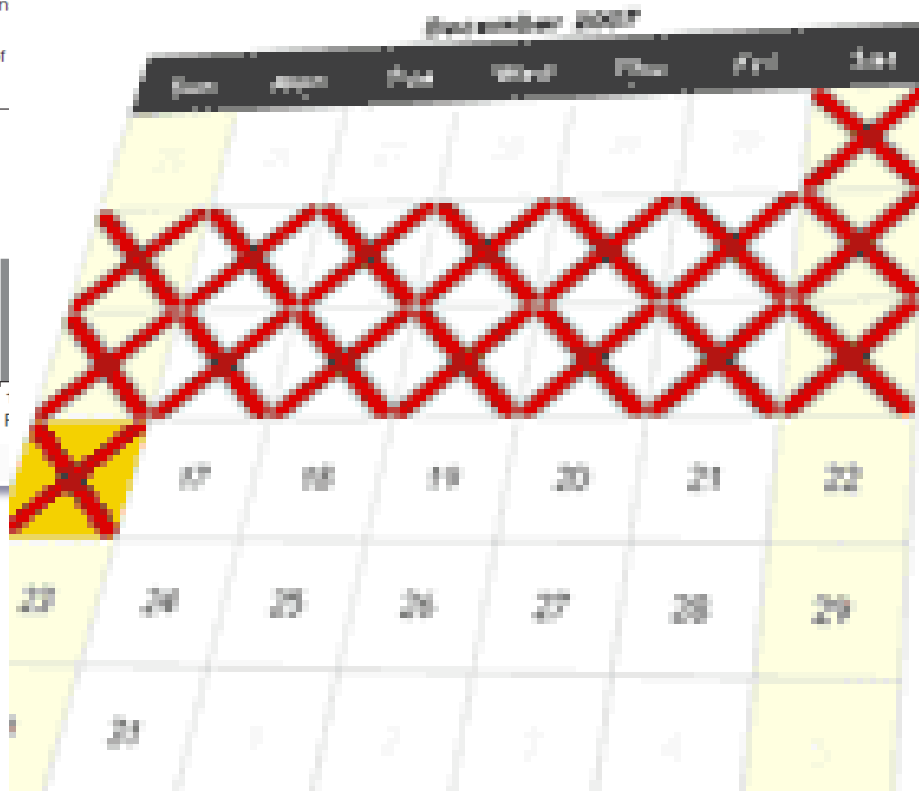
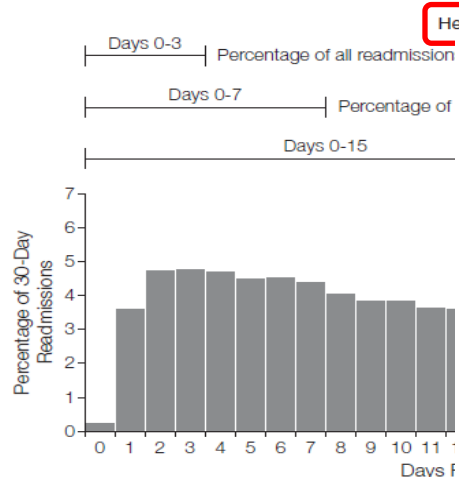
las intervenciones enfermera  
a los pacientes con alto riesgo

las visitas a UCIAS son de

each risk group alone required to meet overall targets for reductions in emergency admissions

reduction (%)	population	% reduction required in risk group		
		High risk (0.5-5% of population)	Moderate risk (6-20% of population)	Low risk (80% of population)
1	10.8	4.0	3.9	2.5
2	21.5	8.1	7.8	5.0
3	32.3	12.1	11.8	7.5
4	43.0	16.2	15.7	10.0
5	53.8	20.2	19.6	12.5
10	107.5	40.4	39.2	25.0

**Figure 1. Thirty-Day Readmissions by Day (0-30) Following Hospitalization for Heart Failure, Acute Myocardial Infarction, or Pneumonia**



COPD



: 60%  
Days  
ue: 60%  
30 Days



HEALTH CARE REFORM

# Association of Self-reported Hospital Discharge Handoffs With 30-Day Readmissions

*Ibironke Oduyebo, MD; Christoph U. Lehmann, MD; Craig Evan Pollack, MD, MHS; Nowella Durkin; Jason D. Miller, MSHI; Steven Mandell, MS, MLA; Margaret Ardolino, MAS; Amy Deutschendorf, MS, RN; Daniel J. Brotman, MD*

**Conclusions and Relevance: Self-reported direct communication** between inpatient and outpatient providers occurred at a low rate but was not associated with readmissions.

This suggests that enhancing interprovider communication at hospital discharge may not, in isolation, prevent readmissions.

# Reduction of Hospital Utilization in Patients With Chronic Obstructive Pulmonary Disease

A Disease-Specific Self-Management Intervention

Type of professionals?

Type of intervention?

Patients?

A  
Pr  
Hos

o  
se  
rial

dropout or death.





There are No “Silver or Magic Bullets”!

Hansen, et al. *Ann Int Medicine* 2011; 155:520-528.

**The meaning of fragility and Complexity are unclear**





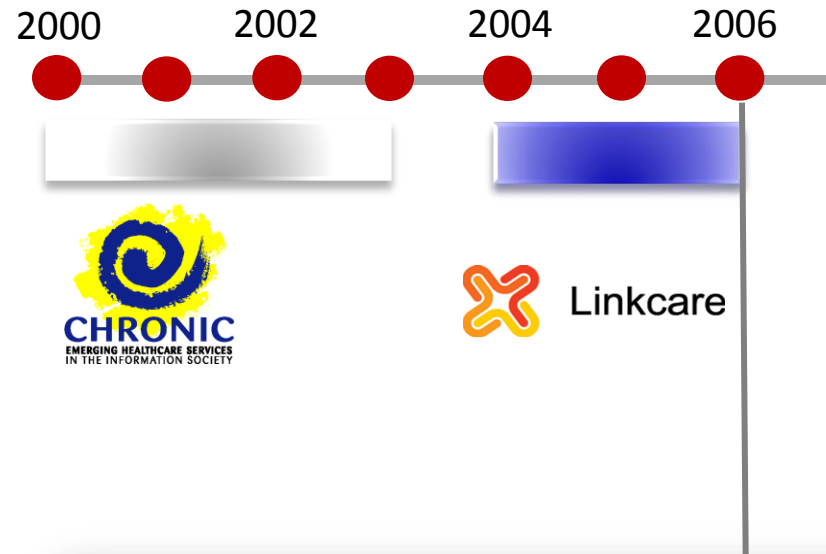
YOU CAN  
DO ANYTHING,  
BUT NOT  
EVERYTHING.

-David Allen

“ALONE WE CAN  
DO SO LITTLE;  
TOGETHER WE  
CAN DO SO MUCH.”

- Helen Keller

# Transfer of prevention of hospitalizations in high risk COPD patients to the community



**Objective** - Analysis of effectiveness of the service provided by the community teams

**Design** – Randomized Controlled Trial (1:1) in frail COPD patients with high hospitalization risk (n=155)

**Area** - Barcelona - Esquerra

**Intervention** – Integrated care with remote support of specialized nurses. Active follow-up during 12 months and passive during 6 years

**Target variables** – Hospital admissions, emergency department visits mortality

Eur Respir J 2006; 28: 1–8  
DOI: 10.1183/09031936.06.00063205  
Copyright©ERS Journals Ltd 2006

## Integrated care prevents hospitalisations for exacerbations in COPD patients

A. Casas\*, T. Troosters<sup>†</sup>, J. Garcia-Aymerich\*, J. Roca\*, C. Hernández\*, A. Alonso\*, F. del Pozo<sup>‡</sup>, P. de Toledo<sup>§</sup>, J.M. Antó\*, R. Rodríguez-Roisin\*, M. Decramer\* and members of the CHRONIC Project

**ABSTRACT:** Hospital admissions due to chronic obstructive pulmonary disease (COPD) exacerbations have a major impact on the disease evolution and costs. The current authors postulated that a simple and well-standardised, low-intensity integrated care intervention can be effective to prevent such hospitalisations.

Therefore, 155 exacerbated COPD patients (17% females) were recruited after hospital discharge from centres in Barcelona (Spain) and Leuven (Belgium). They were randomly assigned to either integrated care (IC; n=65; age mean  $\pm$  so 70  $\pm$  9 yrs; forced expiratory volume in one second (FEV<sub>1</sub>) 1.1  $\pm$  0.5 L, 43% predicted) or usual care (UC; n=90; age 72  $\pm$  9 yrs; FEV<sub>1</sub> 1.1  $\pm$  0.05 L, 41% pred). The IC intervention consisted of an individually tailored care plan upon discharge shared with the primary care team, as well as accessibility to a specialised nurse case manager through a web-based call centre.

After 12 months' follow-up, IC showed a lower hospitalisation rate (1.5  $\pm$  2.6 versus 2.1  $\pm$  3.1) and a higher percentage of patients without re-admissions (49 versus 31%) than UC without differences in mortality (19 versus 16%, respectively).

**AFFILIATIONS**  
\*Servici de Pneumologia and Technology Innovation Unit, Hospital Clinic, IDIBAPS, Universitat de Barcelona, and,  
\*Respiratory and Environmental Health Research Unit, Institut Municipal d'Investigació Mèdica (IMM-IMAS), Universitat Pompeu Fabra, Barcelona,  
\*Grupo de Bioingeniería y Telemedicina (GBT-UPM), Universidad Politécnica de Madrid, Madrid, Spain, and  
\*Respiratory Division, UZ-Leuven, Faculty of Kinesiology and Rehabilitation, KU-Leuven, Belgium.



# Transfer of prevention of hospitalizations in high risk COPD patients to the community

	OR* (95% CI)	p-value
Hospital admissions due to exacerbations	2.17 (0.60-7.87)	0.237

## No reduction in the number of hospitalizations

	OR* (95% CI)	p-value
Emergency room admissions due to exacerbations	0.33 (0.13-0.84)	0.020
	HR* (95% CI)	
Mortality by all-causes	0.36 (0.14-0.93)	0.034

\* Adjusted for baseline differences between UC and IC group (influenza and pneumococcal vaccination)

## Reduction of visits to the Emergency Department and reduced mortality

Improvement in self management of the disease and quality of life (p=0.02). Reduction of anxiety and depression (p=0.001) and major satisfaction of the patients (p=0.02) at 12 months

# Transfer of prevention of hospitalizations in high risk COPD patients to the community

## Contributions

- ✓ Displayed the problems for generalization of RCT results
- ✓ Identified two key factors for a successful deployment at community level:
  - Preparation of health professionals*
  - Prediction of individual risk and patient stratification*

## Strengths and limitations

- ✓ High level of evidence – RCT
- ✓ Highly representative study group
- ✓ Problems of generalization shown by RCTs

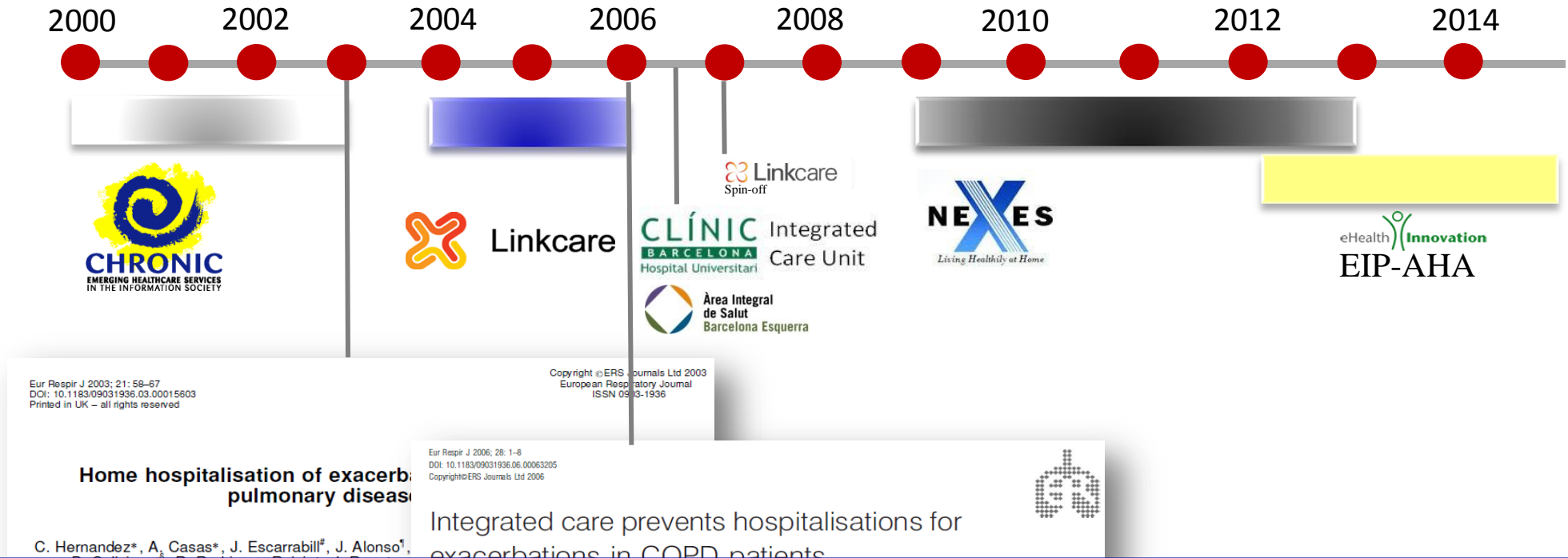
## Future areas of development

- ✓ Development of risk prediction and stratification tools
- ✓ Implement innovative strategies for workforce preparation



# Design and assessment of Integrated Care Services

*historical evolution of the research team*



## Assessment of deployment of 4 Integrated Care Services

- ✓ Welness and rehabilitation
- ✓ Enhanced care for frail patients
- ✓ Home hospitalization
- ✓ Remote support for diagnosis



# Analysis of lessons learned in the NEXES project



## Wellness and Rehabilitation

*(Pragmatic design - Barcelona and Athens)*  
*(Randomised Controlled Trial - Trondheim)*



## Enhanced care for frail patients with high risk for hospitalization

*(Randomized Controlled Trials - Barcelona, Athens y Trondheim)*  
*(Additional trials in en Barcelona)*



## Home hospitalization and early discharge

*(Pragmatic design - Barcelona)*  
*(Randomized Controlled Trial - Athens)*  
*(No deployment - Trondheim)*



## Remote support for high quality diagnosis in primary care

*(Randomized Controlled Trial - Barcelona)*  
*(Observational study - Trondheim )*  
*(No deployment - Athens)*

# Organizational heterogeneity of the sites

*(transferability potential)*

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## Trondheim



- ✓ Driven by Primary Care
- ✓ Extensive and simultaneous transformation of clinical, technological and organizational aspects in the Norwegian pilot for the implementation of the Health System Reform

## Barcelona



- ✓ Driven by a tertiary care hospital with high potential for scalability at regional level within the Catalan Health Plan
- ✓ The implementation of organizational changes in the reform of specialized care took place independently of the NEXES project

## Athens



- ✓ Driven by a tertiary care hospital without a frame for change of the healthcare model



# Analysis of lessons learned in the NEXES project

## Integrated Care Model

### Wellness and Rehabilitation



- ✓ Positive results in Barcelona
- ✓ Efficacy, relevance and high transferability potential
- ✓ Need for design and evaluation of cost-effective services
- ✓ Factors not related to the intervention explain the lack of results in Athens and Trondheim

### Enhanced care for fragile patients



- ✓ Positive results in Athens
- ✓ The Barcelona trial showed efficacy, transferability potential and the need for training of professionals, risk assessment and stratification
- ✓ Need to articulate 4 sub-services:
  - Hospitalization prevention in high-risk patients
  - Support post-discharge
  - Management of complex stable patients
  - Palliative care

# Analysis of lessons learned in the NEXES project

## Integrated Care Model

### Home hospitalization



- ✓ Positive results in Barcelona and Athens
- ✓ Effectiveness, synergies with other services and transferability
- ✓ Potential limitation for deployment in areas (Norway) with insufficient collaboration between hospital and primary care, two different payers, and inadequate ICT support

### Remote support for diagnosis



- ✓ Positive results in Barcelona and Trondheim
- ✓ Cost-effectiveness demonstrated
- ✓ Regional deployment ready
- ✓ Potential for transferability and generalization to other medical specialties

# Analysis of lessons learned in the NEXES project

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## Technological support

- ✓ The ICT model is a relevant element for the success of the deployment

## Business plan

- ✓ Implementation of an integrated reimbursement system (*“bundle payment”*)
- ✓ Development of a business plan with shared risks among actors
- ✓ Reinvestment of cost-savings in innovation of services and ICT

## Evaluation

- ✓ The randomized controlled trials assess efficacy, but show important limitations for assessment of deployment of the services

# Agenda

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- ❑ Healthcare in Catalonia
- ❑ Integral HealthCare area. Barcelona Esquerra
- ❑ Lessons learnt from deployment of Integrated Care
- ❑ Adaptive case management strategies
- ❑ The Nextcare project



The NEW ENGLAND JOURNAL of MEDICINE

Perspective  
OCTOBER 22, 2015

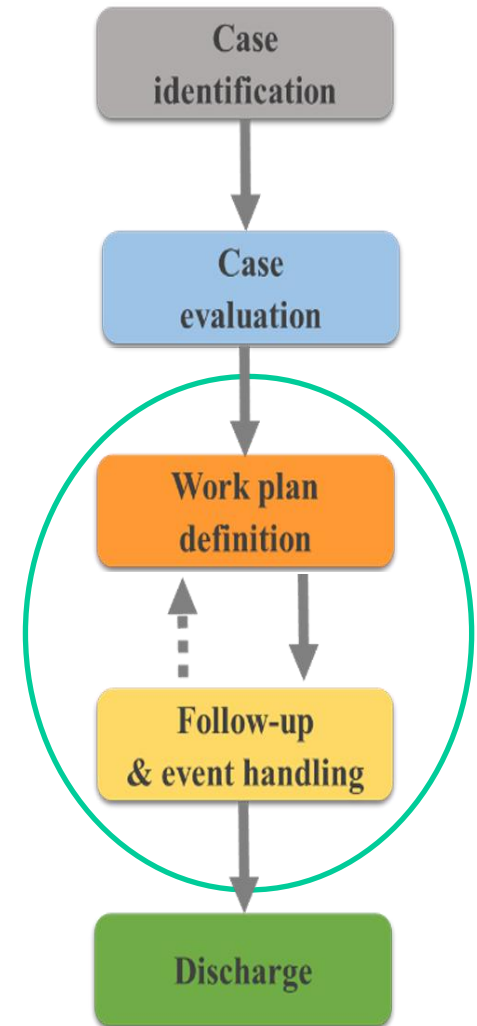
**Transitional Chaos or Enduring Harm? The EHR  
and the Disruption of Medicine**

Lisa Rosenbaum, M.D.

The electronic health record must be adapted to  
healthcare professionals needs and it must be  
interoperable across healthcare layers and providers  
to facilitate collaborative tasks

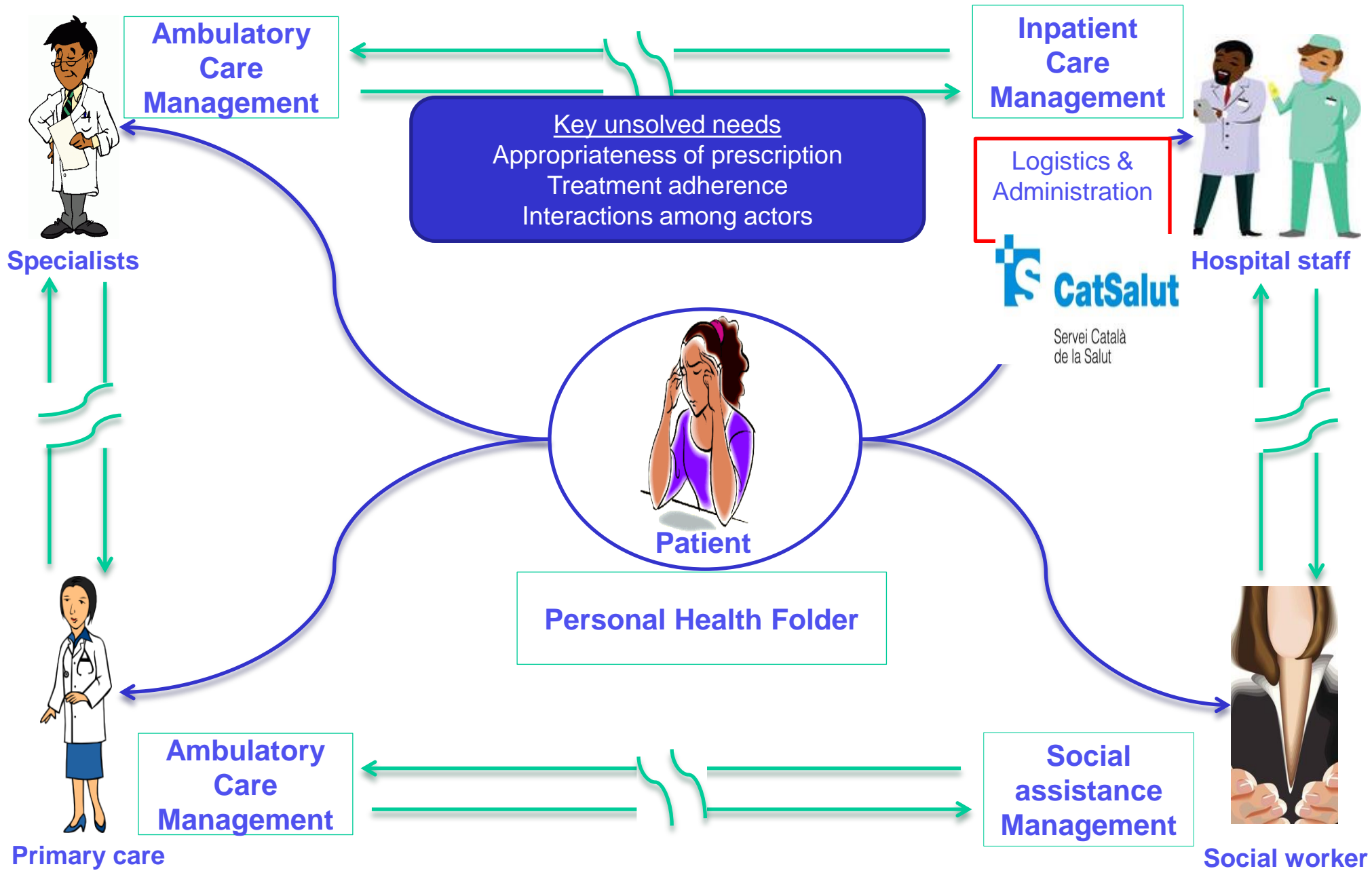
# Collaborative Adaptive Case Management

- ✓ Planning at run-time is a fundamental characteristic of case management using well structured service flows. This implies the selection and scheduling of specific tasks for a case, and ad-hoc collaboration with other case managers on the task
- ✓ Decisions may be triggered by expected and unexpected events or new facts, such as completion of certain tasks or milestones or emergency room entry



Conceptual stages of ICS

# Long-term Oxygen Therapy- Collaborative Case Management is appropriate





# Evaluation of the Long-Term Oxygen Therapy (LTOT) program at Barcelona-Esquerria

**Objective** - Analysis of prescriptions and adherence to LTOT  
- Assessment of health status with emphasis on frailty and complexity  
- Evaluation of need for integrated care

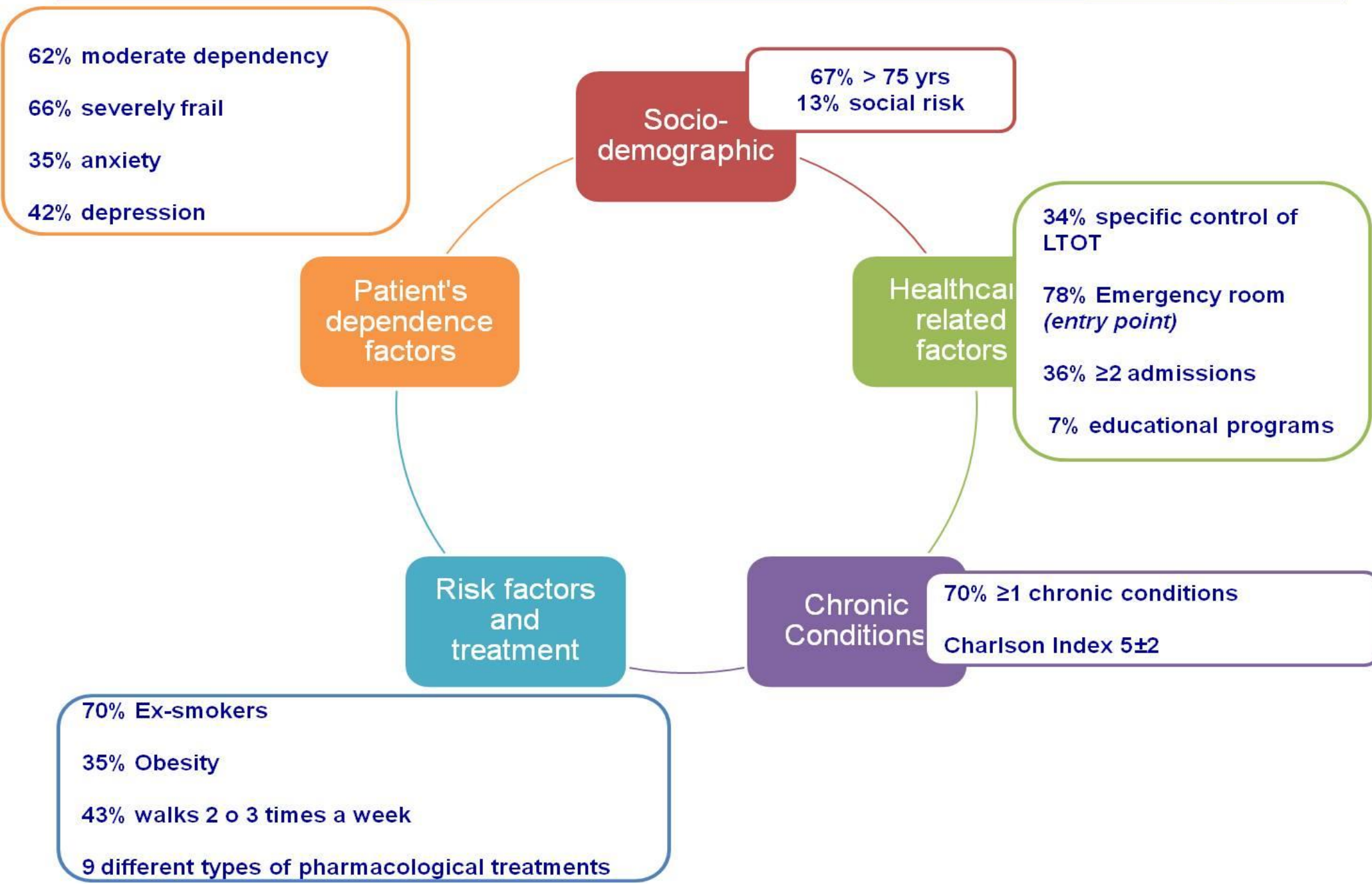
**Area** - Barcelona Esquerria-Eixample

**Design** - Observational cross-sectional

**Method** - Structured questionnaires (*covering the 5 WHO domains*)  
- Arterial respiratory blood gases, forced spirometry, hand-grip strength

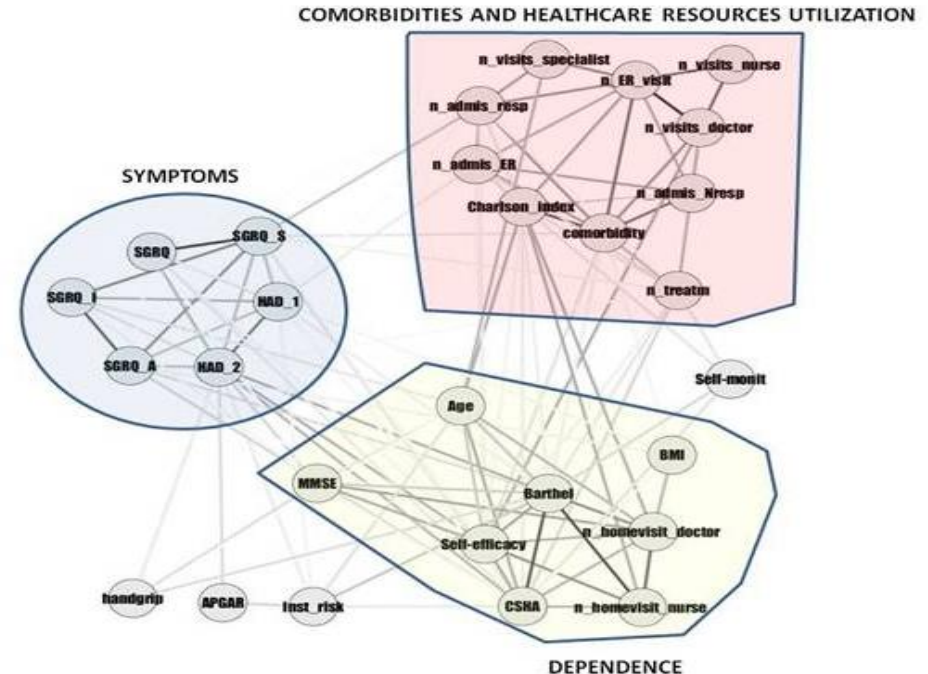
**Target variables** - Adequacy of prescription and adherence to LTOT  
- Health status  
- Frailty and complexity

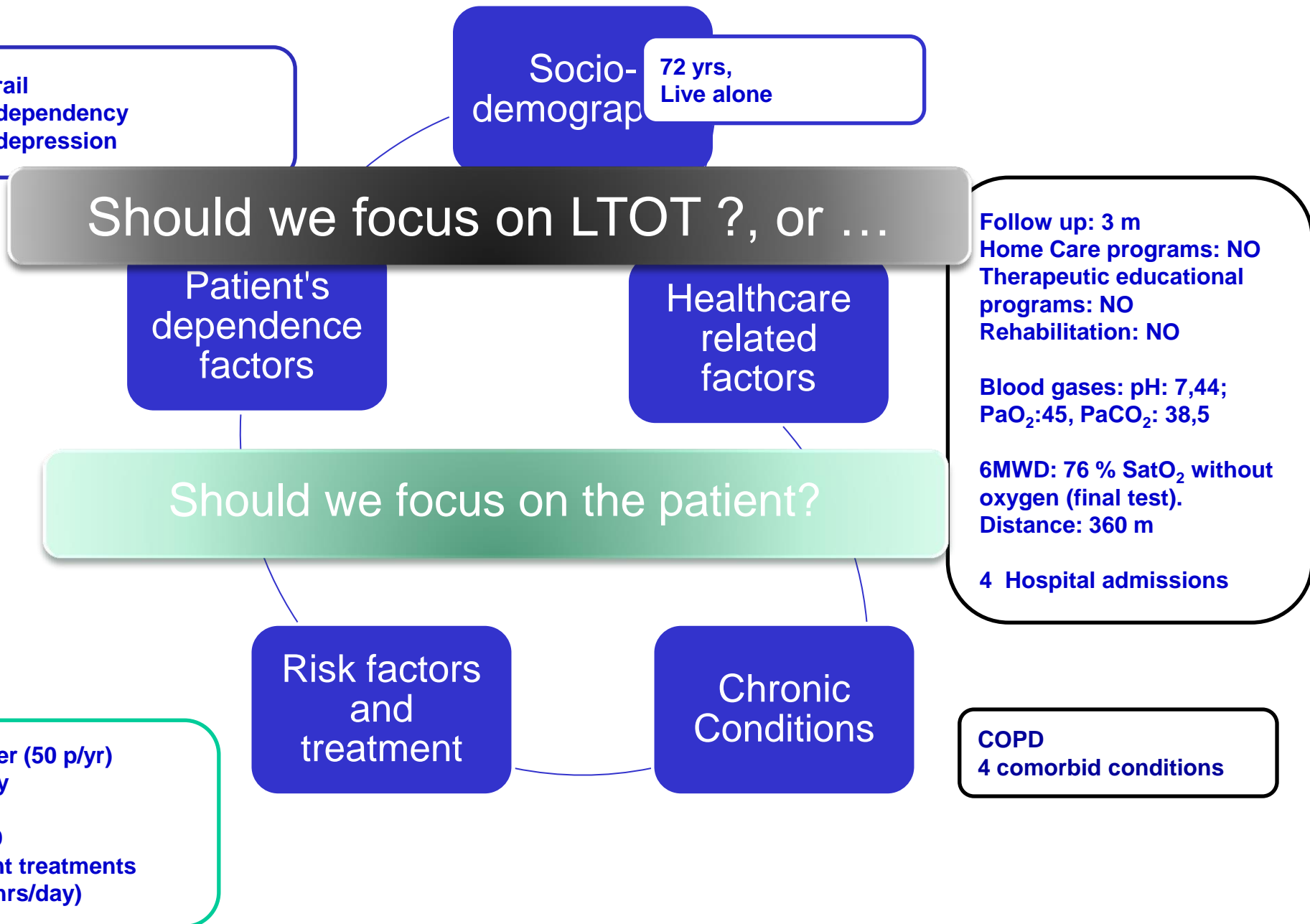
# Socio-demographic and clinical characteristics of the study



# Evaluation of the Long-Term Oxygen Therapy (LTOT) program at Barcelona-Esquerria

- ✓ Adequacy of LTOT prescription (47%) and suboptimal adherence (67%)
- ✓ Need for re-design of the LTOT program
- ✓ Need for change in patient management increasing the role of community-based professionals
- ✓ Need for health individualized health risk prediction and stratification
- ✓ Need for elaboration of an operational definition of frailty





# Evaluation of the Long-Term Oxygen Therapy (LTOT) program at Barcelona-Esquerri

## **Contribution**

- ✓ Provides the bases for a change in management of complex patients based in the community
- ✓ The design of the LTOT program may help to fill current gaps

## **Strengths and limitations**

- ✓ Comprehensive evaluation of these patients provided the information needed for the re-design of novel integrated care services
- ✓ 30% of the patients could not be evaluated

## **Future areas of development**

- ✓ Re-design and evaluation of a new integrated care service
- ✓ Elaboration of an operational definition of frailty
- ✓ Regional deployment of the novel integrated care service

# What have we learnt ?

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Multiple information sources and not always available

High patient turnover

Multiple prescribers (*even outside the region or private*)

Need for alignment among pneumologists

Fragmentation between levels of care

Uncovered needs

Importance of administrative support

Engagement of management should improve

Interoperability of ICT is a must

Roles of professionals should be clarified

Shared-Care should be adopted

Bundle payment systems should be explored

# Conclusions

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- ✓ Integrated Care shows high potential for generation of healthcare efficiencies; but its extensive deployment and adoption remains a challenge
- ✓ Investigations to generate further evidence on efficacy of specific interventions, as well as on extensive deployment of integrated care are needed.
- ✓ Scale-up of integrated care will necessarily require incorporation of methodological approaches based on Implementation Research
- ✓ The organizational change, including new profiles of professionals, are core components for successful deployment of integrated care.





**A new Vision**

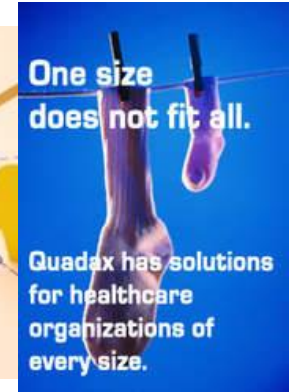
# Some ideas



“The face of health care is changing and as health care providers we must rise to the challenge.”

– Angie Chlpka

# Cooperation between levels of care and services providers



***The RIGHT patient, the RIGHT therapy, the RIGHT time and the RIGHT professionals***

Needs to be delivered *every time* and something has to change

# Areas for improvement

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- ☐ Service evaluation
- ☐ Risk assessment/stratification and service selection
- ☐ Service workflow definition and execution

***Which services are more efficient and which are the most interesting in the right term?***

# Please, get to know the patient better

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- Socio-demographic characteristics
- Health care team and system-related factors
- Chronic conditions
- Risk factors and treatment
- Patient's dependence factors

*Goal-Oriented Patient Care — An Alternative Health. Outcomes Paradigm David B. Reuben, M.D., and Mary E. Tinetti, M.D.*  
*Shared Decision Making — The Pinnacle of Patient-Centered Care Michael J. Barry, M.D., and Susan Edgman-Levitan, P.A. NEJM, 366;9 March 1, 2012*

# “Nothing about me without me”

## Patient Centered Care

*“If we can view the health care experience through the patient’s eyes, we will become more responsive to patients’ needs and, thereby, better clinicians”*

*Goal-Oriented Patient Care — An Alternative Health. Outcomes Paradigm David B. Reuben, M.D., and Mary E. Tinetti, M.D.  
Shared Decision Making — The Pinnacle of Patient-Centered Care Michael J. Barry, M.D., and Susan Edgman-Levitan, P.A. NEJM, 366;9 March 1, 2012*

# Continuous evaluation



... (or conservation)

... recovery time

- Time to get back to “*normal life*”

... health  
... maintenance

- Relapses
- Long-term consequences

$$\text{Value} = \frac{\text{Outcomes}}{\text{Cost}}$$



IF "Plan A"  
Didn't Work.  
The alphabet has  
25 more letters!  
Stay Cool.

# Agenda

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- ❑ Healthcare in Catalonia
- ❑ Integral HealthCare area. Barcelona Esquerra
- ❑ Lessons learnt from deployment of Integrated Care
- ❑ Community-based care management with support of specialists
- ❑ Adaptive case management strategies
- ❑ The Nextcare project

# Regional deployment of ICT-supported integrated care services

*design, evaluation and large scale implementation of five actions  
aiming at generating healthcare-value at system level*

## Multimorbidity

*(cardiovascular diseases; COPD; diabetes type II and anxiety-depression)*

1. Service workflow definition
2. Risk assessment and service selection
3. Evaluation strategies
4. ICT as supporting tools of the services
  - *adaptive case management*
  - *collaborative work*
  - *selective telemonitoring*





