Optimizing Process of Care in Community-Acquired Pneumonia

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III Jornada de Recerca
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Octubre 2010

Infectious Diseases and Antimicrobial Drug Resistance

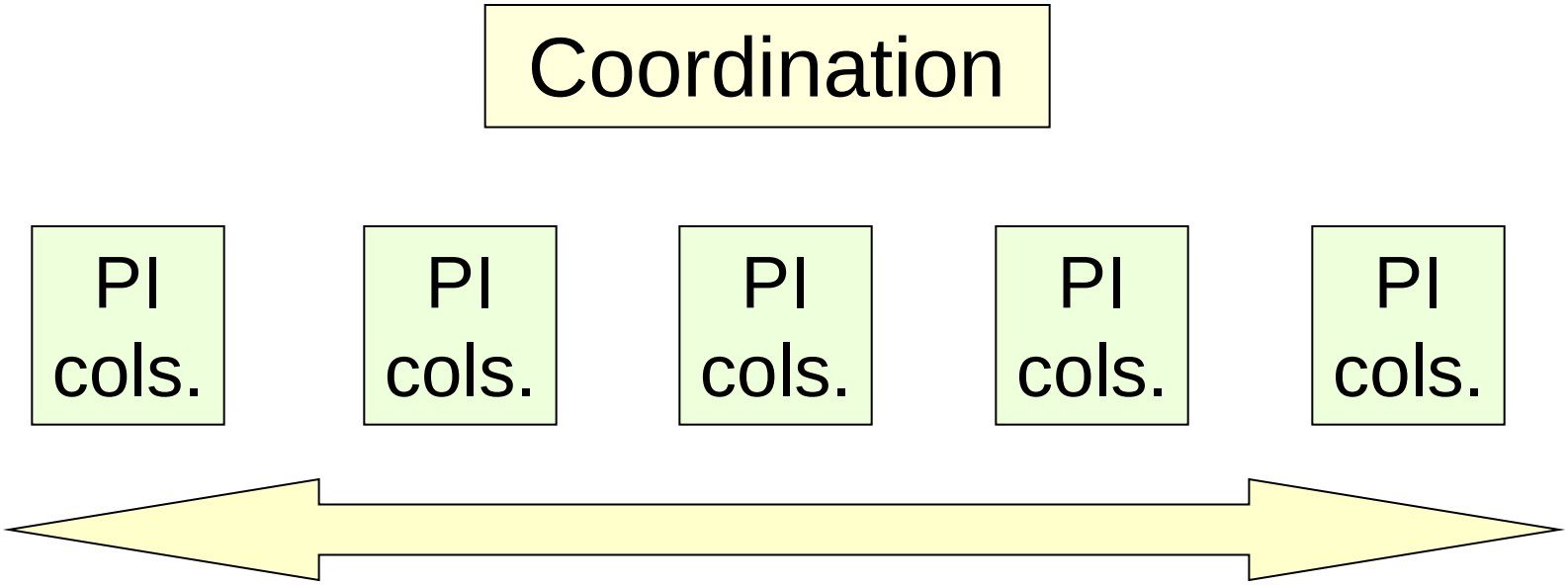
Consolidated research group (AGAUR/SGR 1995)

Consolidated research group (IDIBELL)

Group Composition

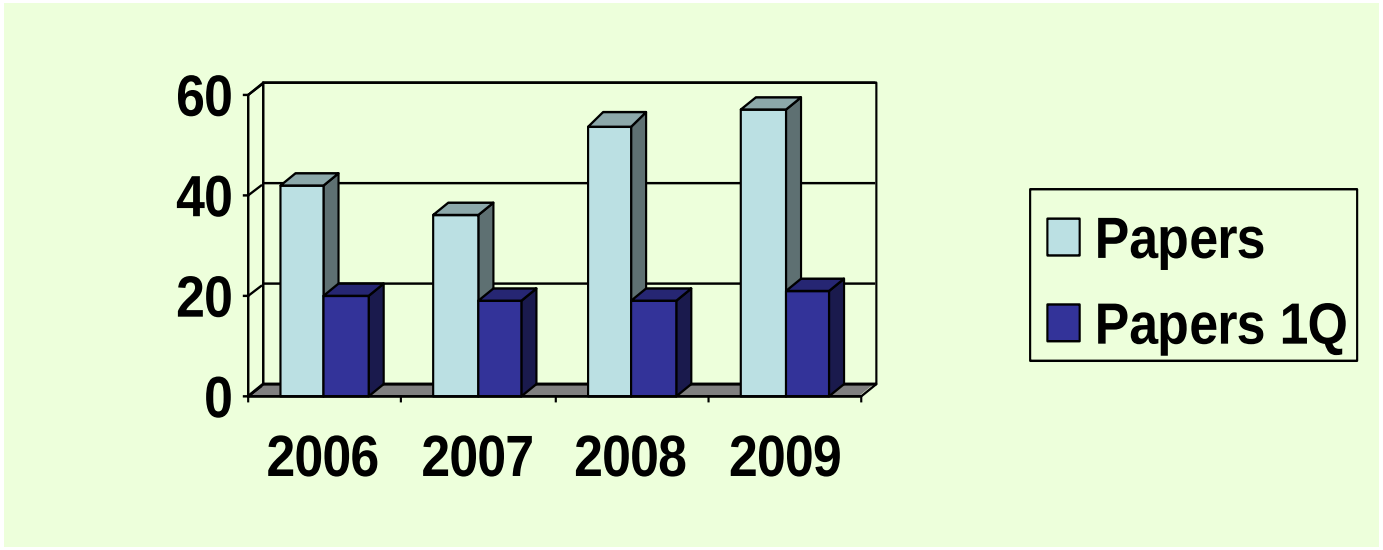
Investigators	15
Physicians ID / Micro	
Part - time	
UB professors	
Collaborators	15
Predoctoral students	10
Technicians	5

Organization



Scientific activity (2006-09)

Papers (ISI)	189 (79 1st Q)
Books and chapters	40
Invited conferences	58
Research projects	33
Clinical trials	32
Guidelines	14



Main Research Lines

1) Clinical and molecular epidemiology of relevant bacteria in community and in health-care associated infections

2) Clinical and experimental studies on bacterial meningitis

3) Clinical and experimental studies on prosthetic infections

4) Optimizing process of care in community-acquired pneumonia

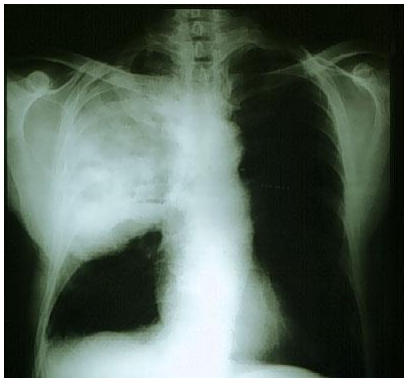
5) Tuberculosis: Pathogenesis; Rapid detection of resistance; Prevention of infection in immunossupressed patients

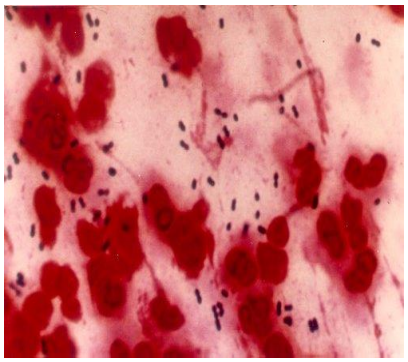
6) HIV infection and AIDS: Secular trends in clinical outcomes; Antirretroviral therapy; Cardiovascular risk assessment.

7) Infections in cancer and transplant patients: Emerging pathogens; Prevention and therapy of viral and fungal infections

Relevance of CAP

- 5 - 10 cases por 1000 persons/year
- 25 - 40 cases among > 70 years old
- 30% patients hospitalized
- Persistant morbidity and mortality
- Substantial economic costs
- New populations at risk
- Emerging pathogens
- Antimcrobial resistance





CAP in Bellvitge Hospital: Background

The early studies

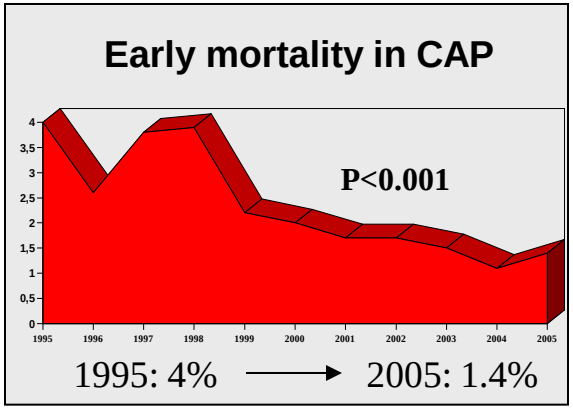
- Neumonía neumocócica bacteriémica: a propósito de 70 casos.
  Gudiol F et al. Medicina Clínica, 1977
- Neumonía aguda de adquisición extrahospitalaria. Distribución etiológica de 451 casos.
  Solans P et al. Revista Clínica Española, 1978

The penicillin-resistance days

- Risk factors and response to penicillin therapy in adults with bacteremic pneumonia caused by penicillin-resistant pneumococci
  Pallares R et al. New England Journal of Medicine,1987
- Clindamycin vs Penicillin for anaerobic lung infections: High rate of failures associated with penicillin-resistant *B. melaninogenicus*
  Gudiol F et al. Archives of Internal Medicine, 1990

Optimizing process of care in CAP

- Initiated 1995 (Fis 95/1100)
- Adult non-immunossupressed pts hospitalized with CAP
- Clinical pathway
- CAP database, 4200 episodes
- Prospective cohort studies
- Randomized trials
- Collaborations



Microbiology: R. Verdaguer, F. Tubau, J. Liñares

Respiratory: J.Dorca, F. Manresa

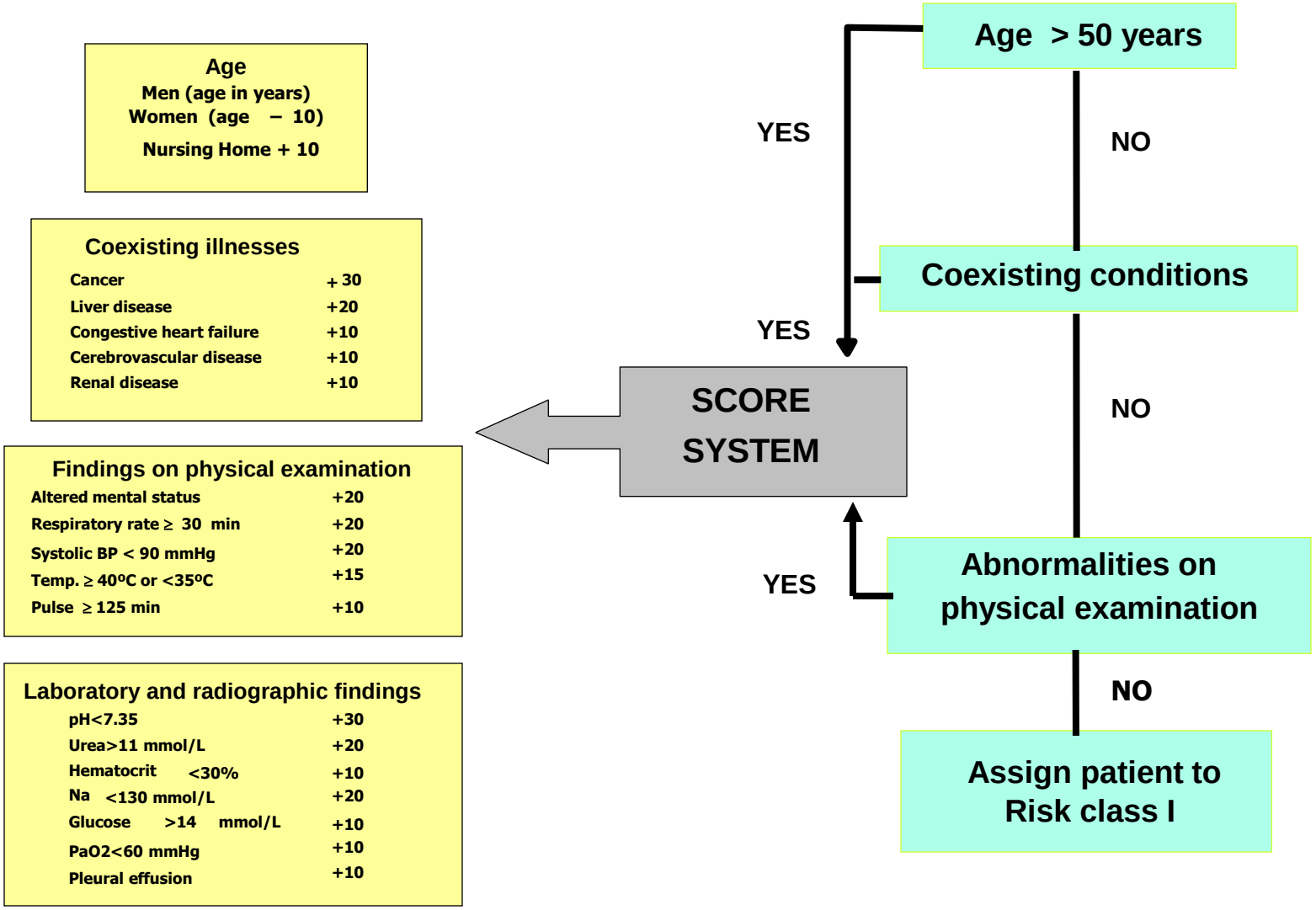
Infectious diseases: J. Carratalà, F. Gudiol

Fellows: A. Fernández, S. Fernández, C. García-Vidal
A. Mykietiuk, B. Rosón, N.Sabé, D. Viasús

Targeted clinical studies on CAP

Diagnosis	Clin Infect Dis	2000
	Clin Infect Dis	2003
	Clin Infect Dis	2004
Risk assessment	Clin Infect Dis	2001
Site of care	Ann Intern Med	2005
Antibiotic therapy	Microb Drug Res	2001
	Clin Infect Dis	2005
Adjunctive therapy	Eur J Clin Microb	2010
Early outcomes	Arch Intern Med	2004
	Eur Resp J	2008
Length of stay	Thorax	2010
Long-term follow-up	Eur J Clin Microb	2006
	Clin Microb Infect	2009
Special populations	Medicine (Balt)	2003
	Arch Intern Med	2007
	Medicine (Balt)	2010
	Medicine (Balt)	2010

THE PNEUMONIA SEVERITY INDEX (PSI)



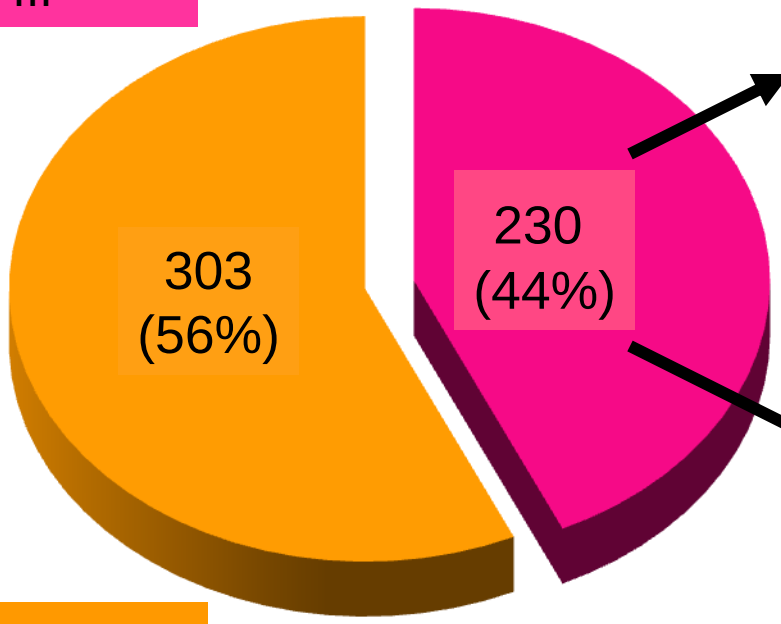
Fine MJ. N Engl J Med 1997

Risk Classes (PSI) and Mortality

Classes	Points	Mortality (30 days)	Site of Care
I	-	0,1 %	Ambulatory
II	≤ 70	0,6 %	Ambulatory
III	71 - 90	1,9 %	??
IV	91 – 130	9,3 %	Hospital
V	> 130	27,0 %	Hospital

Risk classes, reasons for hospitalization and outcomes in 533 patients with CAP

LOW RISK
CLASES
I - III



HIGH RISK
CLASES
IV - V

Respiratory failure
Empyema
Shock

60%

Advanced age
Comorbidities
Unusual etiologies
Extensive pneumonia

40%

Randomized study

Outpatient care compared with hospitalization in low-risk patients with CAP: A randomized trial

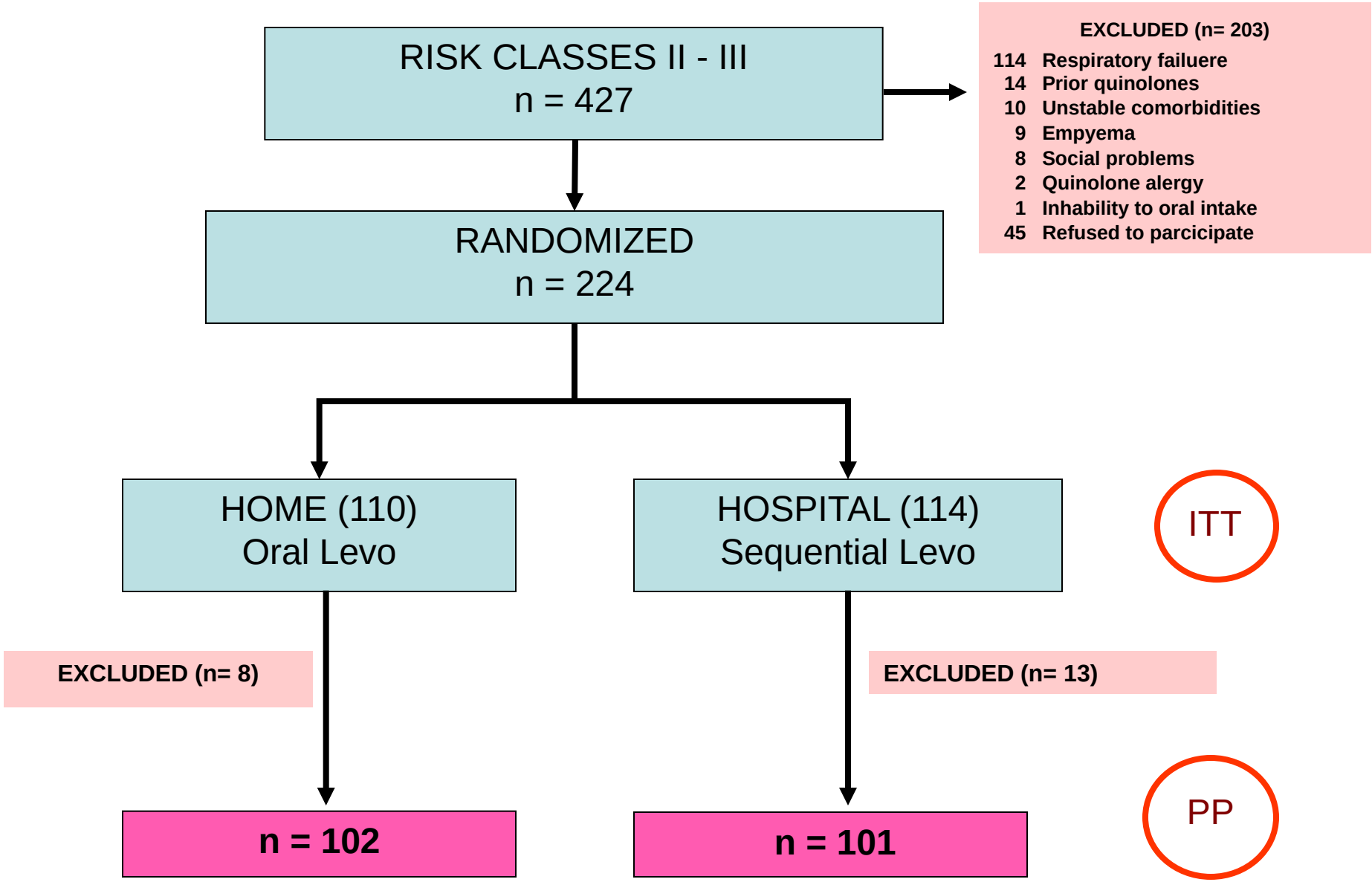
Patients: Pts in PSI class II-III without extenuating conditions

Intervention: Pts were randomly assigned to outpatient care or hospitalization, and received oral or switch therapy with levofloxacin, respectively

Primary end point: Overall successful outcome, according to strict predefined criteria

Secondary end points: Quality of life, satisfaction with care

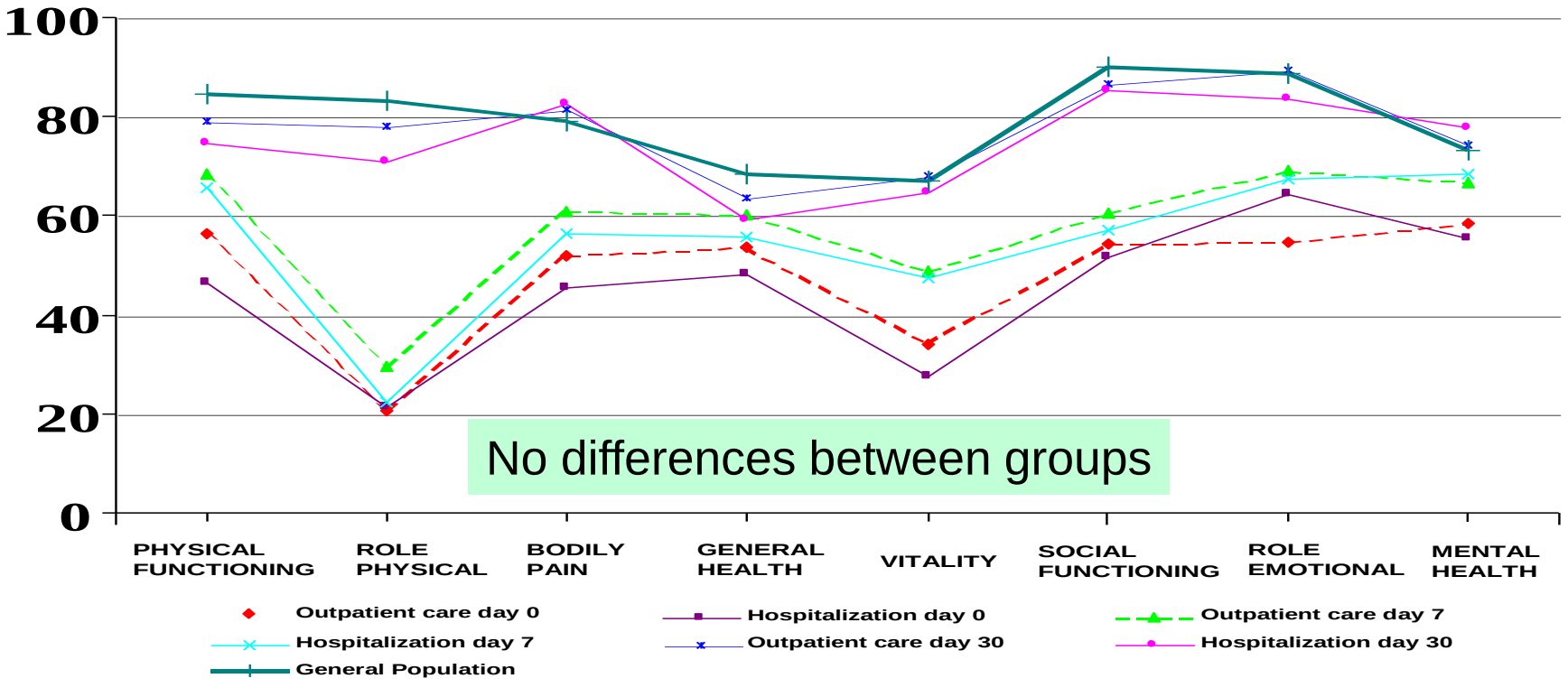
STUDY PROFILE



Outcomes: Intention to Treat Analysis

	Home (114) (%)	Hospital (110) (%)
Overal Successful Outcome	**83.6**	**80.7**
Drug Adverse Effects	9.1	9.6
Medical Complications	0.9	2.6
Aditional Visits	1.8	1.7
Antibiotic Therapy Changes	2.7	3.5
Readmissions (30 days)	6.3	7.0
Mortality (30 days)	0.9	0.0

Quality of Life (SF-36) and Satisfaction with Care



Satisfaction with Care

Outpatient	Hospital	Dif.	IC 95%	*p*
91.2%	79.1%	12.1	1.8 – 22.5	0.03

Effectiveness of a 3-Step Clinical Pathway to Reduce Duration of Intravenous Antibiotic Therapy and Length of Stay in Community-Acquired Pneumonia

Design: Randomized, controlled trial (ISRCTN17875607)

Setting: 2 tertiary care hospitals in Barcelona.

Patients: Immunocompetent adults with CAP requiring hosp.

Exclusion criteria: Lack of consent, ICU admission, shock, aspiration pneumonia, empyema, inability to oral intake.

Primary end point: Length of stay

Secondary end points: Duration of iv antibiotic therapy, adverse effects, readmissions, overall mortality (30 d)

3-STEP CLINICAL PATHWAY

1st - EARLY MOBILIZATION

- Sitting out of bed or ambulating for at least 20 min during the first 24 h of hospitalization
- Progressive mobilization during hospitalization

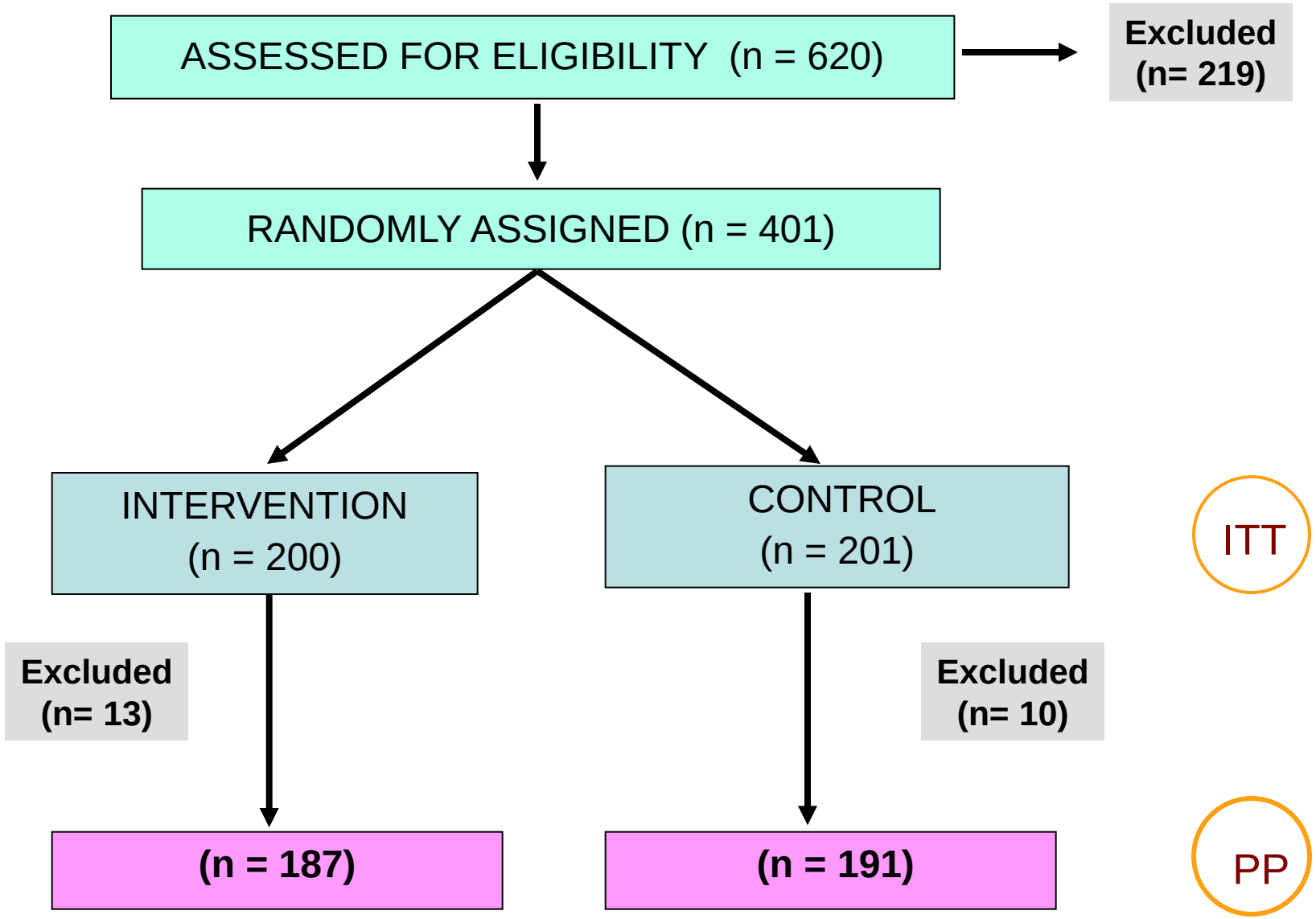
2nd - EARLY SWITCH TO ORAL ANTIBIOTIC THERAPY

- Temperature ≤37,8ºC, improvement or resolution of symptomps, ability to mantain oral intake, hemodynamic stability, stable comorbid conditions

3rd - HOSPITAL DISCHARGE

- Abscence of instability criteria: temperature >37,8ºC; RR > 24'; HR > 100'; SBP ≤ 90 mm Hg; oxygen saturation <90%; altered mental status; inability to mantain oral intake

STUDY PROFILE



OUTCOMES OF STUDY PATIENTS BY TREATMENT GROUP

Intention to Treat Analysis

	Intervention (n=200)	Control (n=201)	
LOS, median days	**3.9** (3.7-4.2)	**6.2** (5.6-6.9)	<.0001
Time to switch, days	2.0 (1.7-2.2)	4.0 (3.4-4.6)	<.0001
Adverse drug reactions	4.5%	16.0%	<.0001
Phlebitis	4.0%	10.5%	
Readmission (< 30d)	9.0%	7.5%	.59
Overall mortality (< 30d)	2.0%	1.0%	.45

Summary

Through prospective studies focused on crucial clinical problems of CAP, we have

- Refined our knowledge on this condition
- Improved the patients process of care
- Disseminated scientific evidence for its proper management
- Provided medical education to our fellows