

L'EQUIP, LES SEVES FUNCIONS I POSSIBILITATS:

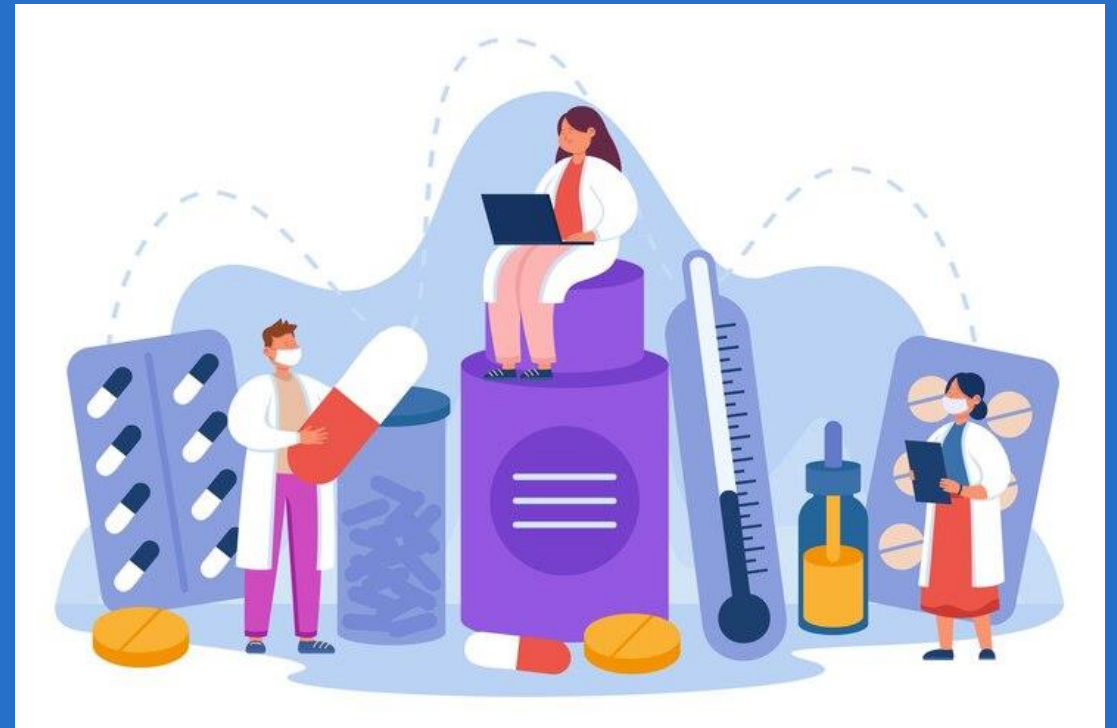
El paper del Farmacèutic

Anna Murgadella Sancho

Servei de Farmàcia

Complex Hospitalari Moisès Broggi. CSI.

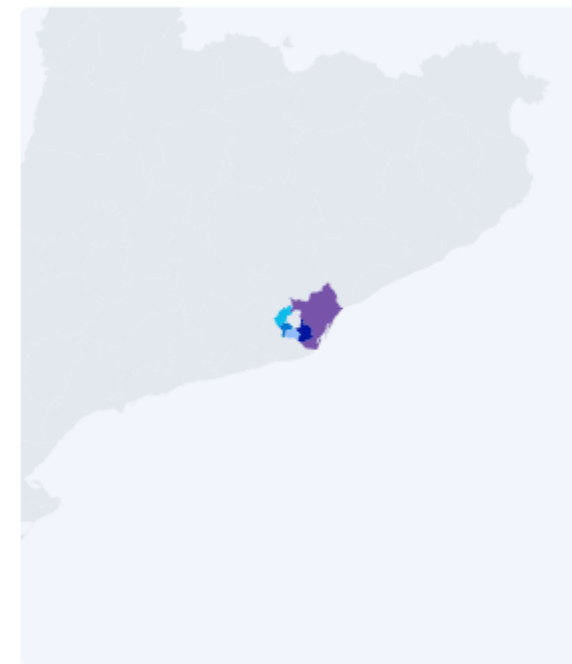
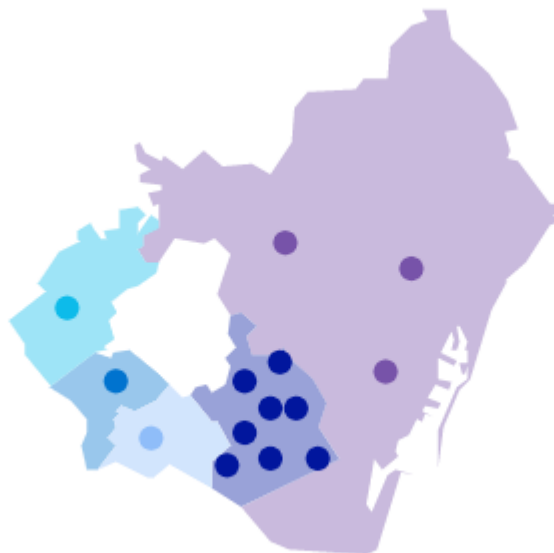
14 de març 2024



Presentació del Consorci Sanitari Integral

El Consorci Sanitari Integral és una **entitat pública**, participada pel Servei Català de la Salut, l'Institut Català de la Salut, els ajuntaments de Sant Joan Despí i l'Hospitalet de Llobregat, el Consell Comarcal del Baix Llobregat i la Creu Roja.

- **Barcelona** (3)
- **L'Hospitalet de Llobregat** (8)
- **Sant Joan Despí** (1)
- **Sant Feliu de Llobregat** (1)
- **Cornellà de Llobregat** (1)



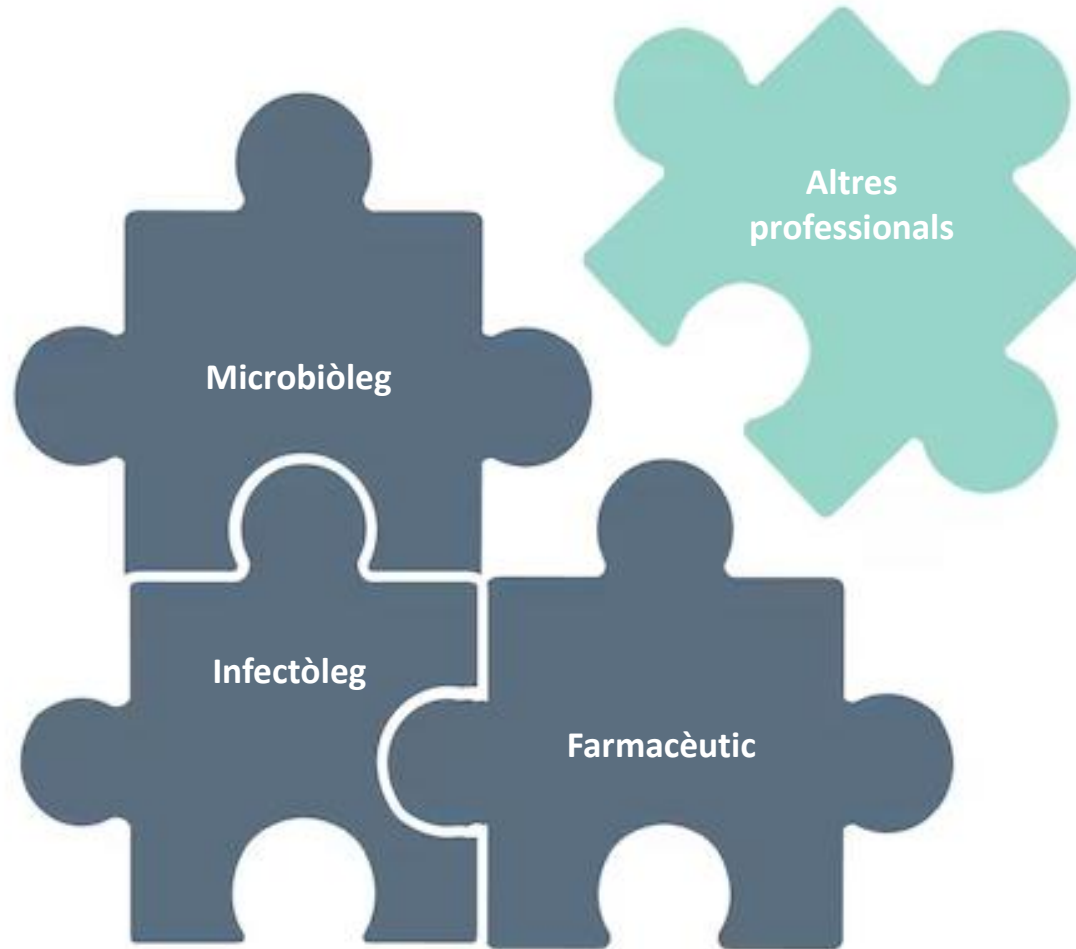
ÍNDEX DE LA SESSIÓ

- APORTACIÓ DEL FARMACÈUTIC DINS L'EQUIP.
- QUINA ÉS LA REALITAT DEL NOSTRE ENTORN?
- TAKE HOME MESSAGES



APORTACIÓ DEL FARMACÈUTIC

DINS L'EQUIP



OBJECTIUS

- **Millorar els resultats** clínics dels pacients amb infeccions
- **Reduir els efectes adversos** dels Antimicrobians (incloses les resistències)
- Garantir teràpies **cost-efectives**



ANTIMICROBIAL STEWARDSHIP PHARMACIST

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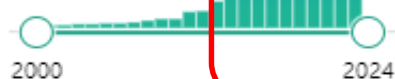
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Page 1 of 111

RESULTS BY YEAR



TEXT AVAILABILITY

- Abstract
- Free full text
- Full text

ARTICLE ATTRIBUTE

- Associated data

Role of the Pharmacist in Antimicrobial Stewardship.

1 Parente DM, Morton J.

Cite Med Clin North Am. 2018 Sep;102(5):929-936. doi: 10.1016/j.mcna.2018.05.009.
PMID: 30126581 Review.

Share The goals of **antimicrobial stewardship** are to optimize **antimicrobial** use to improve patient outcomes and minimize adverse consequences. A successful **antimicrobial stewardship** program is one that is multidisciplinary. **Pharmacists** are core ...

Pharmacist-driven antimicrobial stewardship interventions in patients with COVID-19: a scoping review.

2 Nasr ZG, Elamin W, Basil M, Eljaaly K.

Cite Int J Clin Pharm. 2023 Jun;45(3):613-621. doi: 10.1007/s11096-023-01574-0. Epub 2023 May 10.
PMID: 37162655 **Free PMC article.** Review.

Share METHOD: We followed the Joanna Briggs Institutes manual framework for scoping reviews in our study. Studies that reported **antimicrobial stewardship** (AMS) interventions performed by **pharmacists** in COVID-19 patients were included. ...The impact of **pharmacist** ...

10 YEARS AGO

1. GESTIÓ (anàlisi d'indicadors)
2. TASQUES LOGÍSTIQUES
3. TASQUES CLÍNIQUES

NOWADAYS

1. TASQUES CLÍNIQUES
2. GESTIÓ (anàlisi d'indicadors)
3. TASQUES LOGÍSTIQUES

VALOR

ROLS PROPIS DEL FARMACÈUTIC

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S

- Optimització de la **dosificació** d'ATB
- Optimització de l'**administració** d'ATB
- Monitorització d'**interaccions** d'ATB
- Programes de **T.seqüencial**.
- Adequació de la **durada** dels ATB.

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- **Indicadors:** consum, adequació a guies,...
- **Informes d'avaluació** de nous antimicrobians.
- Garantir **informació ATB** en la prescripció.
- Gestió de problemes de suministrament

ROLS COMPARTITS

- **Audit prospectiu** i feedback
- **Preautorització** de tractaments
- **Desesglaonament** de tractaments
- Monitorització d'**efectes adversos** d'ATB

- Elaboració de **guies/protocols**
- **Educació** (professionals/pacients)
- **Recerca**
- **Eines informàtiques**

PHARMACIST



Pharmacokinetics/pharmacodynamics and therapeutic drug monitoring of ceftazidime/avibactam administered by continuous infusion in patients with MDR Gram-negative bacterial infections

D. Fresan^{1†}, S. Luque^{2,3,4†}, A. Benítez-Cano⁵, L. Sorli^{3,4,6,7*}, M. Milagro Montero^{3,4,6,7}, M. De-Antonio², N. Prim⁸, V. Vega⁹, J. P. Horcajada^{3,4,6,7†} and S. Grau^{2,3,4,7†}

- **Disseny:** Retrospectiu, observacional, 12 mesos.
- **CI:** Infeccions per *P. Aeruginosa* XDR i *K.pneumoniae* BLEE → ceftazidima/avibactam (IC).
- **Intervenció:** TDM (C_{\min}) al 2on dia → ajust de dosis segons TDM
- **Objectiu PK/PD:** $100\%fT > 4 \times MIC$

Table 1. Clinical and pharmacokinetic characteristics of patients

Characteristic	Median (range)
Patients, n	31
Male, n (%)	28 (90.3)
Age (years)	64.0 (37–78)
BMI (kg/m ²)	30.9 (41.3)
Baseline eGFR ^a (mL/min)	70 (105)
Baseline eGFR ^a <50 mL/min, n (%)	7 (22.6)
Renal replacement therapy, n (%)	8 (25.8)
Mechanical ventilation, n (%)	23 (74.2)
Septic shock, n (%)	7 (22.6)
Fluid overload, n (%)	11 (35.5)
Initial CAZ/AVI total dose/day ^a , n (%):	13 (41.9)
• ≤3/0.75 g	8 (25.8)
• >3/0.75 <6/1.5 g	10 (32.3)
• 6 g/1.5 g	
CAZ/AVI treatment duration (days)	21 (3–45)
First free C ₅₅ plasma concentration ^b (mg/L)	49.0 (7.2–172.4)
MIC (mg/L)	XDR-PA: 4 mg/L (2–256) ESBL-K. pneumoniae: 0.38 mg/L (0.38–2)
PK/PD target attainment, n (%)	26 (83.9%)

eGFR, estimated glomerular filtration rate.

^aAt the beginning of CAZ/AVI treatment.

^bBefore TDM dosing recommendations.

100%*f*T > 4 × MIC

Alguns pacients:
100%*f*T = 4- 10 × MIC

N=12
Mantenir dosi (guiat per TDM)

Alguns pacients:
100%*f*T > 10 × MIC
Sobreexposició

N=16
Disminuir dosi (guiat per TDM)

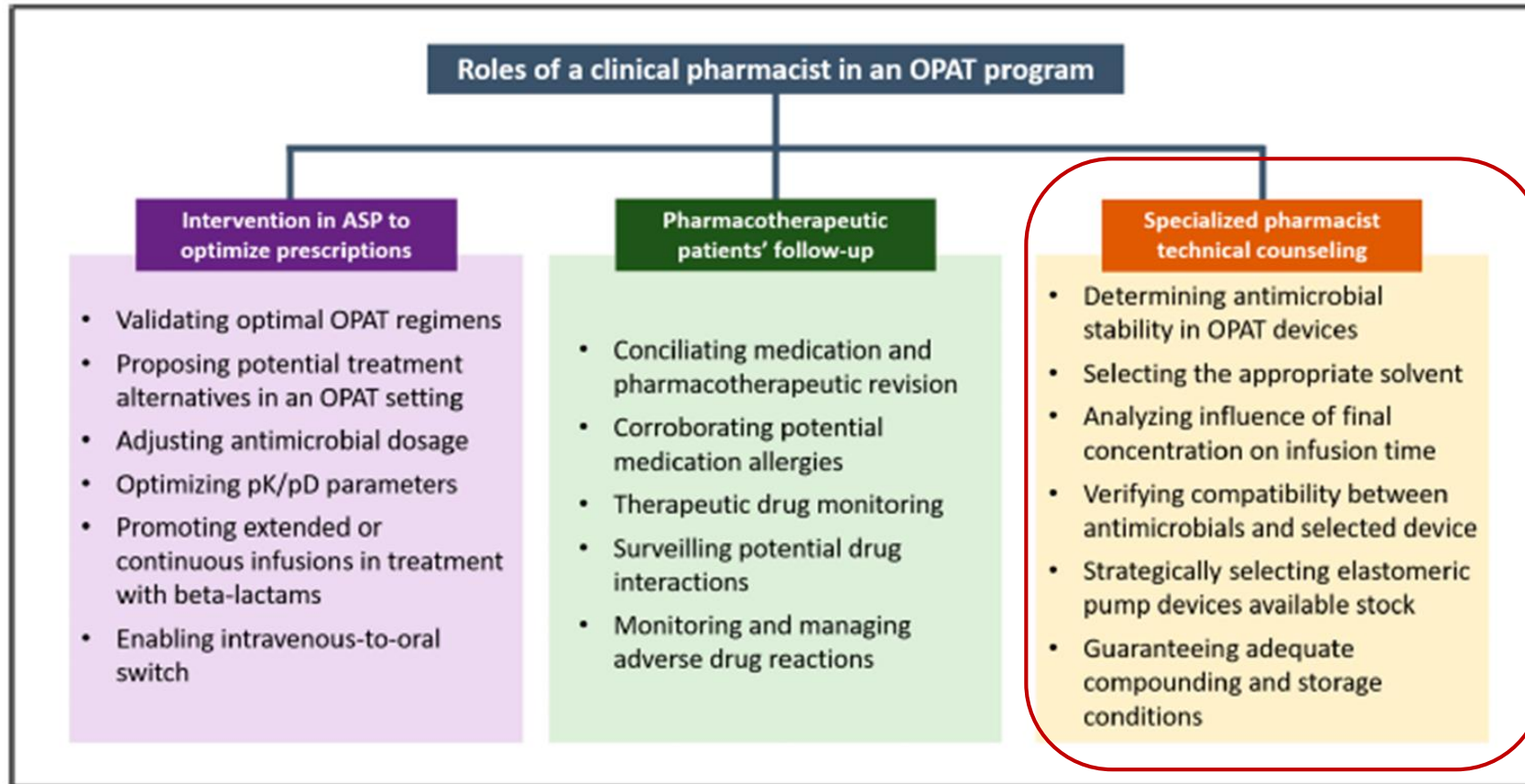
Conclusions

Administration of ceftazidime/avibactam in CI enabled the desired PK/PD target to be achieved in a high proportion of patients with MDR Gram-negative bacterial infections, even at daily doses lower than those recommended for extended 2 h infusion. We suggest that TDM of ceftazidime/avibactam may be a useful tool for reducing doses, especially when CI is used and bacterial strains with low MICs are isolated. This strategy could help to reduce antimicrobial-related adverse effects and treatment costs. Further larger studies evaluating the most efficient and clinically effective doses of ceftazidime/avibactam and the impact of TDM on patient clinical outcomes should be performed.

ROL FARMACÈUTIC: ADMINISTRACIÓ

Review

Successful Integration of Clinical Pharmacists in an OPAT Program: A Real-Life Multidisciplinary Circuit



Estabilitat d'ATB per administració domiciliària (elastòmers/bosses infusió)

Preparació en el S. Farmàcia (cond. Estèrils).

Article

Stability Studies of Antipseudomonal Beta Lactam Agents for Outpatient Therapy

Beatriz Fernández-Rubio ¹, Laura Herrera-Hidalgo ^{1,2,3,*}, Aristides de Alarcón ^{2,3}, Rafael Luque-Márquez ^{2,3}, Luis E. López-Cortés ^{3,4}, Sònia Luque ^{3,5,6}, José María Gutiérrez-Urbón ⁷, Aurora Fernández-Polo ⁸, Alicia Gutiérrez-Valencia ^{2,†} and María V. Gil-Navarro ^{1,2,3,†}

Table 7. Stability of each antibiotic at 4, 25, 32, and 37 °C.

Temperature (°C)	AZT	CEF	CFD	CAZ	C/A	C/T	MRP	MEV	P/T
4	72 h	72 h	72 h	72 h	72 h	72 h	72 h	72 h	72 h
25	72 h	48 h	72 h	48 h	48 h	72 h	30 h	30 h	72 h
32	72 h	48 h	24 h	30 h	30 h	72 h	12 h	12 h	72 h
37	72 h	24 h	24 h	12 h	12 h	48 h	-	-	72 h

Abbreviations: AZT, aztreonam; CEF, cefepime; CFD, cefiderocol; CAZ, ceftazidime; C/A, ceftazidime/avibactam; C/T, ceftolozane/tazobactam; MRP, meropenem; MEV, meropenem/vaborbactam; P/T, piperacillin/tazobactam. Colors are in accordance with the maximum hours of stability of each antibiotic at each temperature: blue (72 h), green (48 h), pink (30 h), yellow (24 h), orange (12 h), and red (<12 h).

*Nous antibiòtics també
elegibles per l'administració
domiciliària i per PC*

ROL FARMACÈUTIC : “ORAL IS THE NEW IV”

Received: 29 January 2021 | Revised: 9 February 2021 | Accepted: 10 February 2021

DOI: 10.1111/jcpt.13397

ORIGINAL ARTICLE

Journal of
Clinical Pharmacy and Therapeutics  WILEY

Impact and barriers of a pharmacist-led practice with computerized reminders on intravenous to oral antibiotic conversion for community-acquired pneumonia inpatients

Inclusió: Pacients amb CAP i ATB iv \geq 48h

Exclusió: No tolerancia oral, desordres GI.

P. pre-intervenció (11m):

Informació verbal dels pacients candidats a ATB OR

P. Intervenció (11m):

Informació escrita (sistema) dels pacients candidats a ATB OR

TABLE 2 Comparing outcome variables between two phases

	Phase 1	Phase 2	
	N = 256	N = 268	p value
Proportion of patients who converted to oral therapy	67.97% (174/256)	97.01% (260/268)	<0.001
Proportion of patients who converted on the day patients were eligible for conversion	34.77% (89/256)	62.69% (168/268)	<0.001
Differences in days between the actual switch and the days patients met criteria for conversion	4.27 ± 3.84	2.51 ± 2.08	<0.001
Length of IV therapy	6.75 ± 3.63	5.52 ± 2.14	=0.001
Total length of antibiotic therapy	12.05 ± 2.80	10.75 ± 2.31	>0.05
Length of hospital stay	7.40 ± 2.99	6.02 ± 2.10	<0.001

ROL FARMACÈUTIC: “SHORTER IS BETTER”

ORIGINAL RESEARCH

Effect of Pharmacist-Initiated Interventions on Duration of Antibiotic Therapy for Acute Exacerbation of Chronic Obstructive Pulmonary Disease and Community-Acquired Pneumonia

Giovanni Iovino and Lynn Nadeau

Can J Hosp Pharm. 2023;76(4):296-301

<https://doi.org/10.4212/cjhp.3421>

CI: 18 a, CAP o AECOPD

CE: VIH, neutropenia, crítics, immunosupressió, empiema i alguns microorganismes (tt perllongat)

Període: 5 mesos

Intervenció: Farmacèutic proposa durada de 5 dies de tractament si criteris d' estabilitat clínica

Outcomes: 1ari) Durada del tt en el període pre i post intervenció i 2ari) readmissió als 30 dies.

TABLE 1. Baseline Characteristics of Study Participants

Characteristic	Study Group; No. (%) of Participants	
	Control (n = 100)	Intervention (n = 100)
Age (years) (mean ± SD)	72.6 ± 14.1	71.9 ± 14.8
Biological sex		
Male	51 (51)	51 (51)
Female	49 (49)	49 (49)
Diagnosis		
Acute exacerbation of COPD	34 (34)	33 (33)
Community-acquired pneumonia	66 (66)	67 (67)

COPD = chronic obstructive pulmonary disease, SD = standard deviation.

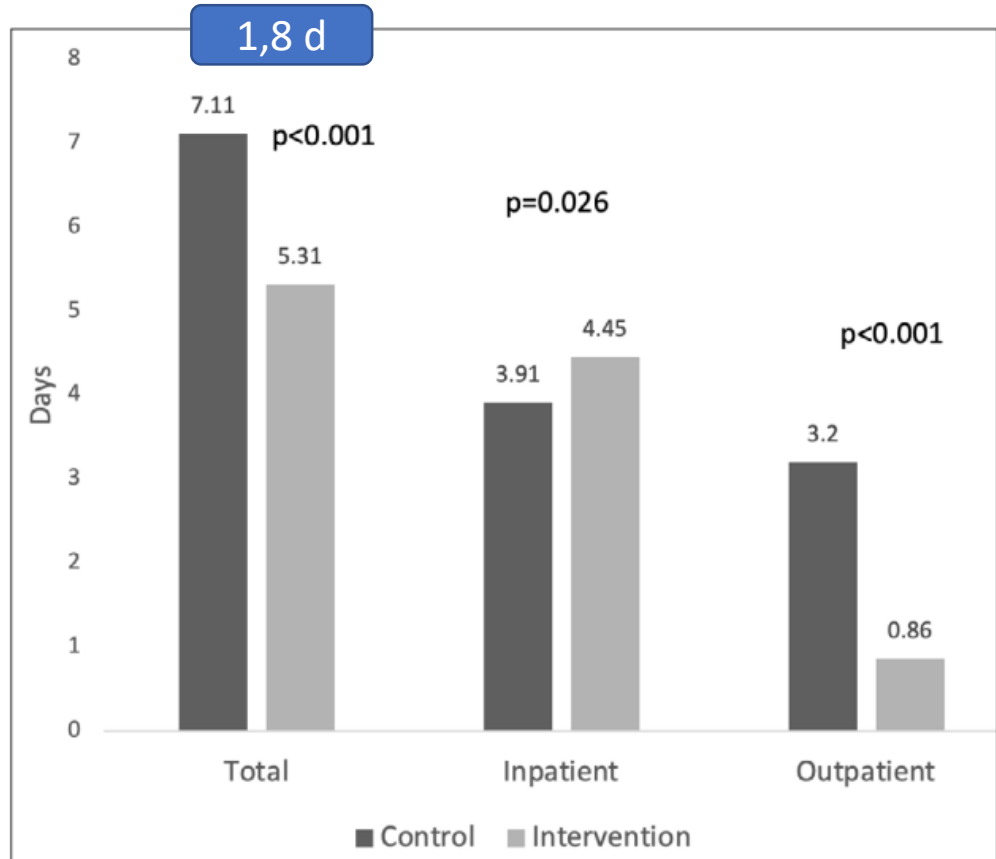


FIGURE 2. Mean duration of antibiotic use.

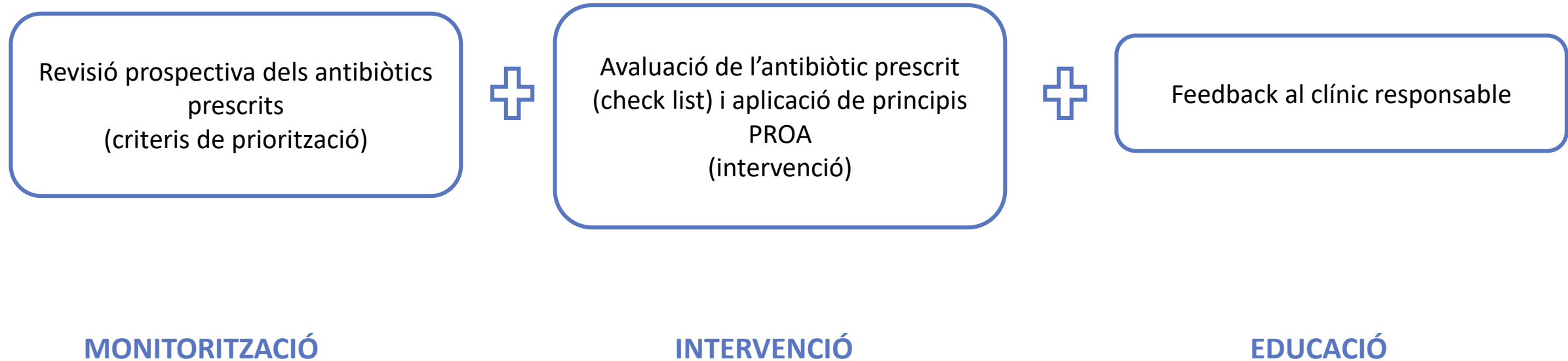
Outcome 2ari	Control	Intervenció
Readmissió 30 d	19% (19)	19% (19)

PHARMACIST



AMS TEAM





RESEARCH ARTICLE

Impact of a Prospective Audit and Feedback Antimicrobial Stewardship Program in Pediatric Units in Tertiary Care Teaching Hospital in Thailand

Sineenart Chautrakarn, MSc,² Suvaporn Anugulruengkitt, MD,^{2*} Thanyawee Puthanakit, MD,^{2*} Thanapoom Rattananupong, PhD,² Narin Hiransuthikul, MD, PhD²

H. Pediàtric, PAFB multidisciplinar

ATB ampli espectre

Resultats: Reducció de DOT, sense dif. en mortalitat o LOS

European Journal of Clinical Microbiology & Infectious Diseases
<https://doi.org/10.1007/s10096-018-03465-z>

ORIGINAL ARTICLE



Clinical outcome of pharmacist-led prospective audit with intervention and feedback after expansion from patients using specific antibiotics to those using whole injectable antibiotics

Kengo Ohashi¹ • Tomoko Matsuoka¹ • Yasutaka Shinoda^{1,2} • Takayuki Mori¹ • Shinya Yoshida¹ • Tomoaki Yoshimura^{1,2} • Tadashi Sugiyama²

RESEARCH ARTICLE

Effects of infectious disease consultation and antimicrobial stewardship program at a Japanese cancer center: An interrupted time-series analysis

Naoya Itoh ^{1,2*}, Nana Akazawa¹, Eri Kanawaku¹, Hiromi Murakami¹, Yuichi Ishibana¹, Daichi Kawamura¹, Takanori Kawabata³, Keita Mori ³, Eiichi N. Kodama⁴, Norio Ohmagari^{2,5,6}

H.oncològic, PAFB multidisciplinar en combinació amb IC infec.

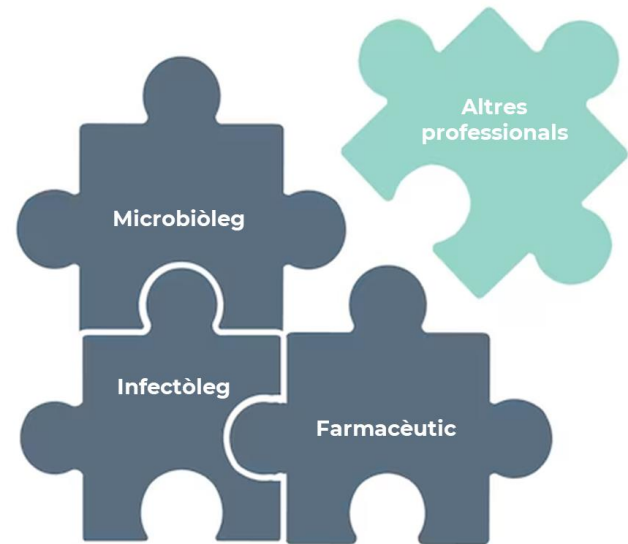
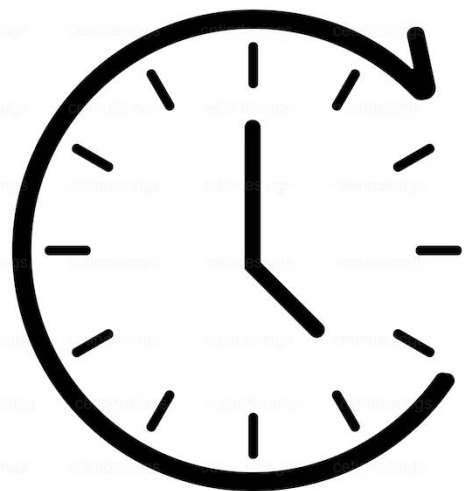
ATB ampli espectre

Resultats: Reducció de DOT, sense dif. en mortalitat o LOS

H,general, PAFB farmacèutics

Tots els ATB endovenosos amb software informàtic

Resultats: Reducció en els dies d'ATB iv, i en LOS, sense diferències en mortalitat





**QUINA ÉS LA REALITAT AL
NOSTRE ENTORN?**



Article

Cross-Sectional Survey on the Current Role of Clinical Pharmacists among Antimicrobial Stewardship Programmes in Catalonia: Much Ado about Nothing

Daniel Echeverría-Esnaol ^{1,2,*} , Sergi Hernández ³ , Anna Murgadella-Sancho ⁴, Ramón García-Paricio ⁵, Sara Ortonobes ⁶, Melisa Barrantes-González ⁷, Ariadna Padullés ^{8,9}, Alexander Almendral ³ , Montse Tuset ⁷ , Enric Limón ^{3,9,10} , Santiago Grau ^{1,2,11,*} and on behalf of the Catalan Infection Control Antimicrobial Stewardship Programme (VINCat-ASP) [†]

Table 1. Characteristics of hospitals and available computer tools of antimicrobial stewardship programmes.

	Total	Group 1 (≥500 Beds)	Group 2 (200–499 Beds)	Group 3 (<200 Beds)	p Value
Number of hospitals included	49	7	16	26	
Number of beds	189.0 (131.0–365.0)	723.0 (650–763)	309.0 (212.5–395.0)	134.0 (100.0–159.3)	<0.001

70% dels elegibles



	Total	Group 1 (≥500 Beds)	Group 2 (200–499 Beds)	Group 3 (<200 Beds)	<i>p</i> Value
Number of years since ASP establishment	5.0 (4.0–8.0)	5.0 (3.0–7.0)	6.0 (4.3–10.0)	4.0 (3.0–6.5)	0.118
Number of years since clinical pharmacists were incorporated into ASP	5.0 (4.0–8.0)	5.0 (3.0–7.0)	6.0 (4.0–10.0)	4.0 (3.0–6.5)	0.364
Number of pharmacists in ASP	1.0 (1.0–1.0)	1 (1–2)	1 (1–1)	1 (1–1)	0.122
Number of hours dedicated by clinical pharmacists to ASP per week	5.0 (2.0–10.0)	10.0 (2.0–20)	7.0 (5.3–10.0)	3.0 (1.0–7.0)	0.012



	Total	Group 1 (≥500 Beds)	Group 2 (200–499 Beds)	Group 3 (<200 Beds)	<i>p</i> Value
ID Training	42	7 (100.0)	15 (93.8)	20/25 (80.0)	0.240
<i>MSc, PhD, BCIDP</i>	14 (28.6)	4 (57.1)	6 (40.0)	4 (20.0)	0.158
<i>Courses and conferences</i>	28 (57.1)	3 (42.9)	9 (60.0)	16 (80.0)	0.254



	Total	Group 1 (≥500 Beds)	Group 2 (200–499 Beds)	Group 3 (<200 Beds)	<i>p</i> Value
<i>ASP computer tools</i>					
	23 (46.9)	4 (57.1)	9 (56.3)	10 (38.5)	0.449
3 Computer tool includes a specific section of recommendation for intravenous-to-oral switch	5 (10.2)	2 (28.6)	0 (0)	3 (11.5)	0.108
1 Computer tool includes the need to prescribe the length of treatment at the time of prescription	14 (28.6)	3 (42.9)	5 (31.3)	6 (23.1)	0.565
	2 (4.1)	1 (14.3)	1 (6.3)	0 (0)	0.206
	1 (2.0)	0 (0)	0 (0)	1 (3.8)	0.637
2 Computer tool includes the need to include the diagnosis at the time of prescription	7 (14.3)	2 (28.6)	5 (31.3)	0 (0)	0.010
	8 (16.3)	3 (42.9)	3 (18.8)	2 (7.7)	0.078
	8 (16.3)	2 (28.6)	4 (25.0)	2 (8.0)	0.239

ACTIVITATS PROA DEL FARMACÈUTIC DINS L'EQUIP

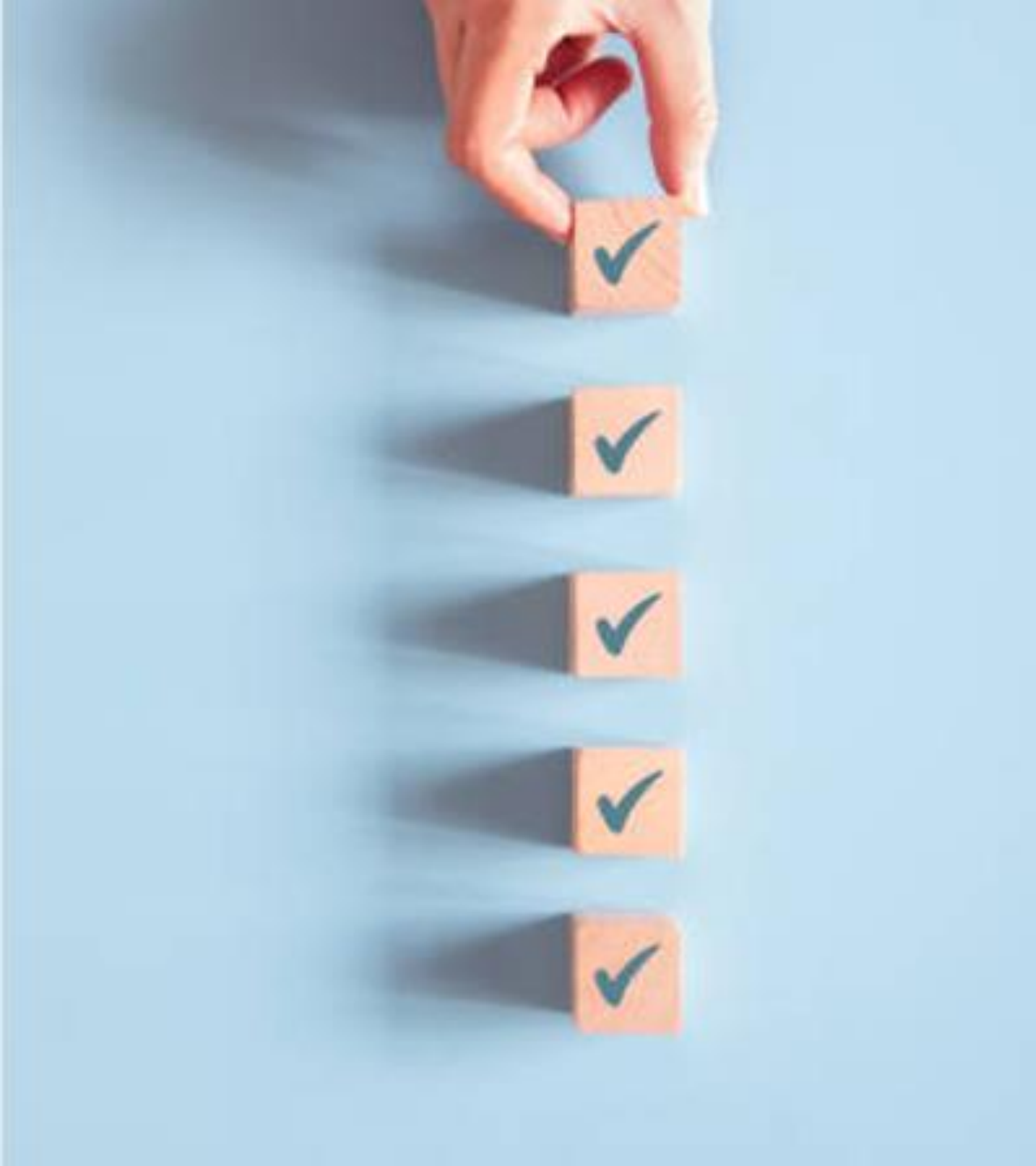
	Total (n = 48)	Group 1 (n = 7)	Group 2 (n = 16)	Group 3 * (n = 25)	p Value
<i>ASP activities</i>					
Number of annual meetings	6.0 (5.0–8.0)	6.0 (5.0–12.0)	12.0 (6.0–40.0)	4.0 (4.0–31.5)	0.088
Revision of restricted antimicrobials	42 (87.5)	5 (71.4)	16 (100.0)	21 (84.0)	0.121
Dosing recommendations	46 (95.9)	7 (100.0)	16 (100.0)	23 (92.0)	0.383
Beta-lactam extended/continuous administration recommendations	34 (70.8)	4 (57.1)	14 (87.5)	16 (64.0)	0.187
Didactic education	26 (55.3)	5 (71.4)	10/15 (66.7)	11 (44.0)	0.245
Preauthorization	21 (43.8)	3 (42.9)	10 (62.5)	8 (32.0)	0.158
Prospective audit and feedback	28 (58.3)	4 (57.1)	13 (81.3)	11 (44.0)	0.062
Antimicrobial spectrum-related recommendations	38 (80.9)	6 (85.7)	14 (87.5)	18/24 (75.0)	0.579
Antimicrobial therapy duration recommendations	44 (91.7)	5 (71.4)	16 (100)	23 (92.0)	0.074
Antimicrobial-related side events monitoring	32 (68.1)	5 (71.4)	12 (75.0)	15 (62.5)	0.693
Antimicrobial–drug interaction monitoring	41 (85.4)	7 (100.0)	15 (93.8)	19 (76.0)	0.145
Antimicrobial desensitisation	12 (25.0)	2 (28.6)	6 (37.5)	4 (16.0)	0.292
<i>Number of desensitisations</i>	5.0 (4.5–5.0)	24.5 (0–49.0)	4.0 (1.0–5.0)	1.5 (1.0–15.5)	0.262
Intravenous-to-oral antimicrobial switch	39 (81.3)	6 (85.7)	14 (87.5)	19 (76.0)	0.621
Antimicrobial guidelines development	47 (97.9)	7 (100.0)	16 (100.0)	24 (96.0)	0.625
Recommendations to perform cultures or swabs	16 (33.3)	1 (14.3)	9 (56.3)	6 (24.0)	0.052
Investigation	12 (25.0)	4 (57.1)	5 (31.3)	3 (12.0)	0.040
<i>Number of hours in a month</i>	4.0 (5.0–27.5)	4.0 (2.5–31.0)	5.0 (3.0–30.0)	2.0 (0–2.0)	0.381
Teaching	20 (41.7)	5 (71.4)	10 (62.5)	5 (20.0)	0.006
Therapeutic drug monitoring	34 (70.8)	7 (100.0)	13 (81.3)	14 (56.0)	0.041
<i>Recommendations are made by ASP pharmacists</i>	18 (52.9)	2 (28.6)	10 (76.9)	6 (42.9)	0.073

Activitats més realitzades (>85%):

- Optimització de la dosificació
- Optimització de la durada
- Monitorització d'interaccions
- Revisió d'ATB ús restringit
- Desenvolupament de guies

One hospital did not answer these questions. * Categorical variables presented in percentages. Continuous variables presented in median (Q1–Q3). ASP: antimicrobial stewardship programme.

Amb tu, per la teva salut

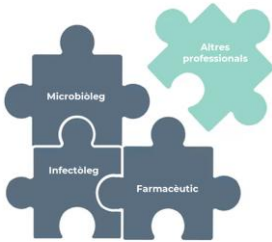
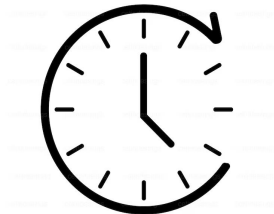


TAKE HOME MESSAGES

EVOLUCIÓ



NECESSITATS



PRESENT/FUTUR





MOLTES GRÀCIES...

