

SUPPLEMENTARY MATERIAL

Title: Outpatient Parenteral Antimicrobial Therapy (OPAT) in Italy: A Scoping Review

Authors

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Supplementary Table 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews Checklist [29]

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON
TITLE			
Title	1	Identify the report as a scoping review.	Title
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	Background
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	Methods, Defining and aligning the objective and question
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Methods
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	Methods, Eligibility criteria
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	Methods, Evidence searching, selection, data extraction, and presentation of the evidence
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Supplementary Table 2
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	Methods, Evidence searching, selection, data extraction, and presentation of the evidence
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	Methods, Evidence searching, selection, data extraction, and presentation of the evidence
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	Methods, Evidence searching, selection, data extraction, and presentation of the evidence
Critical appraisal of individual sources of evidence	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Not applicable
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	Methods, Analysis of the evidence, presentation of the

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON
			results and summary of the findings
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Results, Figure 1
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Results, Supplementary Table 3
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Results, Supplementary Table 3
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Results, Table 1-3, Supplementary Table 3
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Discussion
Limitations	20	Discuss the limitations of the scoping review process.	Limitations
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Conclusion
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	Funding

Supplementary Table 2. Complete search strings

DATABASES AND REGISTERS		
PUBMED		
# 1	((("Patients"[MeSH Terms] OR "client*" [All Fields]) AND ("home environment"[MeSH Terms] OR ("home"[All Fields] AND "environment"[All Fields]) OR "home environment"[All Fields] OR "home"[All Fields])) OR ("Outpatients"[MeSH Terms] OR "outpatient*" [All Fields] OR "out patient*" [All Fields]))	290,769
#2	((("Anti-Infective Agents"[MeSH Terms] OR "anti infective agent*" [All Fields] OR "Anti-Bacterial Agents"[MeSH Terms] OR "anti bacterial agent*" [All Fields] OR "antibiotic*" [All Fields]) AND ("outpatient clinics, hospital"[MeSH Terms] OR "Outpatient Care"[All Fields] OR "Outpatient Health Service"[All Fields] OR "hospital outpatient clinic*" [All Fields] OR "Ambulatory Care"[MeSH Terms] OR "Home Infusion Therapies"[All Fields] OR "Home Infusion Therapy"[MeSH Terms] OR "Outpatient Infusion Therapies"[All Fields] OR "Ambulatory Care Facilities"[All Fields] OR "ambulatory care facilit*" [All Fields] OR "Home Care Services"[MeSH Terms] OR "Domiciliary Care"[All Fields] OR "Home Care"[All Fields] OR "home care services, hospital based"[MeSH Terms] OR "ambulatory health center*" [All Fields] OR "outpatient clinic*" [All Fields])) OR "OPAT"[All Fields]	9,203
#3	"Italy"[Mesh] OR ital*	1,520,588
#4	# 1 AND #2 AND #3	226
CINAHL		
# 1	((MH "Patients+" OR TX client*) AND (MH "Home Environment" OR (TX home AND TX environment) OR TX "home environment" OR TX home)) OR (MH "Outpatients+" OR TX outpatient* OR TX "out patient*")	358.756
#2	((MH "Anti-Infective Agents+" OR TX "anti infective agent*" OR MH "Anti-Bacterial Agents+" OR TX "anti bacterial agent*" OR TX antibiotic*) AND (MH "Outpatient Clinics, Hospital+" OR TX "Outpatient Care" OR TX "Outpatient Health Service" OR TX "hospital outpatient clinic*" OR MH "Ambulatory Care+" OR TX "Home Infusion Therapies" OR MH "Home Infusion Therapy+" OR TX "Outpatient Infusion Therapies" OR MH "Ambulatory Care Facilities+" OR TX "ambulatory care facilit*" OR MH "Home Care Services+" OR TX "Domiciliary Care" OR TX "Home Care" OR MH "Home Care Services, Hospital-Based+" OR TX "ambulatory health center*" OR TX "outpatient clinic*")) OR TX OPAT	7.216
#3	(MH "Italy" OR TX ital*)	391.241
#4	# 1 AND #2 AND #3	1.056
WEB OF SCIENCE		
# 1	TS=(patient* OR client* OR "home environment" OR home OR outpatient* OR "out patient*")	9,629,691
#2	TS=(("anti-infective agent*" OR "anti bacterial agent*" OR antibiotic*) AND ("outpatient care" OR "outpatient health service" OR "hospital outpatient clinic*" OR "ambulatory care" OR "home infusion therap*" OR "outpatient infusion therap*" OR "ambulatory care facilit*" OR "home care services" OR "domiciliary care" OR "home care" OR "home care services, hospital based" OR "ambulatory health center*" OR "outpatient clinic*")) OR OPAT)	2,710
#3	TS=("Italy" OR ital*)	468,400
#4	# 1 AND #2 AND #3	45
SCOPUS		
# 1	((TITLE-ABS-KEY (patients) OR TITLE-ABS-KEY (client*)) AND (TITLE-ABS-KEY ("home environment") OR (TITLE-ABS-KEY (home) AND TITLE-ABS-KEY (environment)) OR TITLE-ABS-KEY (home))) OR (TITLE-ABS-KEY (outpatients) OR TITLE-ABS-KEY (outpatient*) OR TITLE-ABS-KEY ("out patient*"))	608,312
#2	((TITLE-ABS-KEY("anti-infective agent*") OR TITLE-ABS-KEY("anti bacterial agent*") OR TITLE-ABS-KEY(antibiotic*)) AND (TITLE-ABS-KEY("outpatient clinics, hospital") OR TITLE-ABS-KEY("outpatient care") OR TITLE-ABS-KEY("outpatient health service") OR TITLE-ABS-KEY("hospital outpatient clinic*") OR TITLE-ABS-KEY("ambulatory care") OR TITLE-ABS-KEY("home infusion therap*") OR TITLE-ABS-KEY("outpatient infusion therap*") OR TITLE-ABS-KEY("ambulatory care facilit*") OR TITLE-ABS-KEY("home care services") OR TITLE-ABS-KEY("domiciliary care") OR TITLE-ABS-KEY("home care") OR TITLE-ABS-KEY("home care services, hospital based") OR TITLE-ABS-KEY("ambulatory health center*") OR TITLE-ABS-KEY("outpatient clinic*"))) OR TITLE-ABS-KEY(OPAT)	11,512

#3	TITLE-ABS-KEY ("Italy") OR TITLE-ABS-KEY (ital*)	588,266
#4	# 1 AND #2 AND #3	160
OTHER METHODS		
Centers for Disease Control and Prevention	OPAT	23
European Centre for Disease Prevention and Control	OPAT	0
Società Italiana di Medicina Tropicale e Salute Globale	OPAT	0
Società Italiana di Malattie Infettive e Tropicali	OPAT	0
Citation searching	-	0

Legend. CINAHL Cumulative Index to Nursing and Allied Health Literature; OPAT Outpatient parenteral antimicrobial therapy

Supplementary Table 3. Data extraction of included studies (n=23)

First author Title Year Journal	Study design Setting Sample size Age of participant Personnel	Type of infection Microorganism Antimicrobial agent Dose, schedule, length Route, device, infusion system	Clinical outcomes Safety outcomes Pharmacological outcomes Patient-reported outcomes Organizational outcomes Economic outcomes
Babich [32] Feasibility of 24 h continuous-infusion cefiderocol administered by elastomeric pump in attaining an aggressive PK/PD target in the treatment of NDM-producing <i>Klebsiella pneumoniae</i> otomastoiditis 2025 Journal of antimicrobial chemotherapy - antimicrobial resistance	Observational retrospective case report Home 1 31 Laboratory staff / nurse / physician, NR	Otomastoiditis <i>Klebsiella pneumoniae</i> Cefiderocol 6g daily, 24h CI, mean 62 days IV, midline, elastomeric pumps	Clinical improvement No AEs (0%) Therapeutic drug monitoring confirmation of optimal PK; PD target attainment NR NR NR
Carlotto [53] Outpatient parenteral antibiotic therapy for cellulitis. A 10-year single-centre experience 2010 Clinical Microbiology and Infection	Observational retrospective cohort Infusion center 171 57.3±16.9 (mean, SD) NR	Cellulitis <i>Staphylococcus aureus</i> [34.2% (3.4% MRSA)], <i>Streptococcus</i> spp (18.1%), CNS (17.2%) Ceftriaxone (59.8%), teicoplanin (22.2%), other NR, NR, mean 13 days NR, NR, NR	Clinical cure (93.7%); Readmission (9.6%) NR NR NR Total saving: 2186 days of hospitalization over 10 years NR
Di Giambenedetto [40] Implementing a Personalized Antimicrobial Stewardship Program for Women with Gynecological Cancers and Healthcare-Associated Infections 2022 Journal of personalized medicine	Observational retrospective case series Dedicated facility 27 60 (49-70) (median, IQR) Infectious diseases specialist, trained nurse, physicians, pharmacists, caregiver	Urinary tract infections (44.4%), bloodstream infections (33.4%), surgical site infections (7.4%), pelvic inflammatory disease (7.4%), pneumonia (3.7%), rectovesical fistula (3.7%) <i>Enterobacterales</i> spp (61.1% ceftriaxone/carbapenems-resistant) Ertapenem 55.6%, ceftriaxone 14.8%, piperacillin/tazobactam 11.1%, meropenem 3.7%, daptomycin 3.7%, teicoplanin 3.7%, amikacin 3.7%, colistin 3.7% NR, Meropenem TID, piperacillin/tazobactam CI, median 11-15 days IV, NR, elastomeric pump	Clinical cure (100%); Relapse (3.7%) AEs: removal of indwelling vascular catheters (source of infection, 18.5%); removal of urinary catheters (associated with urinary tract infections) NR NR Personalized antimicrobial stewardship program NR
Di Marino [43] Acute coronary syndromen resulting from endocarditis on a bioprosthetic valve	Observational retrospective case report Home 1	Nosocomial infectious endocarditis Multidrug-resistant <i>Staphylococcus hemolyticus</i> NR	Patient asymptomatic, hemodynamically stable; normally mobile bioprosthetic valve leaflets without vegetations, and cleansed abscess NR

2024	79	NR, NR, more than 6 weeks	NR
Journal of Cardiovascular Echography.	NR	IV, NR, NR	NR
21st National Congress of Italian Society of Echocardiography and Cardiovascular Imaging			NR
Eckmann [34]	Observational retrospective cohort	Skin and soft tissue	Clinical recurrence, readmission (<1%)
Antibiotic treatment patterns across Europe in patients with complicated skin and soft-tissue infections due to meticillin-resistant Staphylococcus aureus: A plea for implementation of early switch and early discharge criteria	NR	MRSA	NR
	8 (Italy)	Unclear	NR
	55.4±15.3 (mean, SD)	NR, NR, mean from 10.1 to 18.6 days	NR
2014	NR	IM / IV, NR, NR	Protocols explicitly including OPAT were available in only 7.6% of Italian hospitals
International journal of antimicrobial agents			Potential cost savings due to bed-days units saved in euro: average cost €2,430±2,785, Italian country-specific costs €2,642±3,028
Esposito [33]	Observational prospective cohort	Chronic Suppurative Otitis Media	Clinical cure and bacteriological eradication (67%); clinical improvement (23%)
Ceftazidime for outpatient parenteral antibiotic therapy (OPAT) of chronic suppurative otitis media due to Pseudomonas aeruginosa	Home	<i>Pseudomonas aeruginosa</i>	No AEs (0%)
	52	Ceftazidime	NR
2000	8.4, 6-12 (mean, range)	500mg, BID, mean from 7 to 10 days	NR
Journal of chemotherapy	Managing physician, parents	IM, NR, NR	NR
			NR
Esposito [46]	Observational prospective cohort	Pneumonia, osteomyelitis, wound infection, septic arthritis, bronchitis, urinary tract infection, fever of unknown origins, cellulitis, other	Cure (over 90%)
Treatment of lower respiratory tract infections in Italy: the role of outpatient parenteral antibiotic therapy	Home	NR	NR
	200	Ampicillin, cefotaxime, ceftazidime, ceftriaxone, ceftriaxone/amikacin, ceftriaxone/azithromycin, levofloxacin, trimethoprim	NR
2001	NR		High patient satisfaction
Chemotherapy	Family member, general practitioner, infectious disease specialist, nurse, oncologist, psychologist	NR, NR, NR	NR
		IM (over 50%) / IV, NR, infusion by gravity or push	NR
Esposito [47]	Observational prospective cohort	Pneumonia (15.7%), osteomyelitis (13.1%), chronic bronchitis (10.4%), skin and soft tissue infection (7.8%), fever of unknown origin (6.8%), sepsis (6.1%), acute exacerbation of chronic bronchitis (5.8%), urinary tract infection (5.6%), septic arthritis (5.1%), subcutaneous abscess (4.8%), tonsillitis (2.0%), endocarditis (1.8%), cellulitis (1.5%), otitis (1.5%), surgical wound infection (1.3%), pyelonephritis (0.8%), other (10.1%)	Cure (74.7%); improvement (3.2%); no change of clinical conditions or failure (0.7%); lost to follow-up (3.8%); death (2%); not specified (15.6%)
Outpatient parenteral antibiotic therapy (OPAT): The Italian Registry	Infusion center, home		AEs (total 9.1%): hepatic dysfunction (0.3%), renal dysfunction (0.3%), vestibular crisis (0.3%), diarrhoea (0.5%), skin rash (4.0%), skin rash and fever (0.3%), fever (0.3%), nausea/vomiting
2002	396		

Infezioni in Medicina	52.7 (mean)	NR	(1.5%), urticaria (0.8%), anaphylactoid reaction (0.3%), cardiogenic shock (0.5%), not specified (0.3%)
	Family members, nurse, physician	Ceftriaxone (33.5%), teicoplanin (18.1%), amikacin (8.9%), ciprofloxacin (4.6%), cefonicid (3.6%), ceftazidime (3.6%), levofloxacin (3.6%), netilmicin (1.8%), piperacillin/tazobactam (1.7%), lincomycin (1.6%), ampicillin (1.6%), rifampicin (1.6%), cefodizime (1.5%), pefloxacin (1.3%), amoxicillin/clavulanic acid (1.2%), cefotaxime (1.2%), clarithromycin (1.2%), erythromycin (1.2%), meropenem (0.8%), trimethoprim/sulfamethoxazole (0.8%), other (7.1%)	NR
		NR, NR, NR	High satisfaction (82%)
		IM (37.4%) / IV (62.6%), NR, NR	NR
Esposito [35]	Observational retrospective cohort	Skin and soft tissue, bone and joint, pneumonia, other	Improvement (95.1%); failure (2.4%); no change (1.4%)
Outpatient parenteral antibiotic therapy (OPAT) in different countries: a comparison	Infusion centre in hospital (49.5%), home (16.8%), infusion centre out of hospital (4.4%), other (3.7%)	NR	NR
2004		Amikacin, ceftriaxone, levofloxacin, teicoplanin, others	NR
International journal of antimicrobial agents	620	NR, NR, mean 56.0 days	NR
	NR	IM (39.4%) / IV, Peripheral catheter (53%) / PICC (6.6%) / port (0.2%) / other (0.6%), gravity (91.2%) / syringe pump (0.3%) / electronic pump (0.3%) / push (8.2%)	NR
	Family members, nurse, physician		NR
Esposito [54]	Observational retrospective cohort	Osteomyelitis (52.3%), septic arthritis (18.8%), prosthetic joint (18.8%), spondylodiskitis (10%)	Cure (60%); improvement (29.2%); relapse (2.5%); impairment (7.5%); no variation (0.8%)
Outpatient parenteral antibiotic therapy for bone and joint infections: An Italian multicenter study	Hospital centre (51.4%), home (30.1%), clinic (7.9%), care facility (1.8%), doctor office (0.8%)	NR	AEs (11%): renal impairment, hepatic impairment, diarrhoea, fever, rash, leukopenia, nausea, vomiting, urticaria, itching, anaphylactoid reaction
2007		Teicoplanin (38%), ceftriaxone (14.7%), ciprofloxacin, levofloxacin, rifampicin; ciprofloxacin, pefloxacin, clindamycin, oxacillin, netilmicin, cotrimoxazole, gentamicin, coamoxiclav, other	NR
Journal of chemotherapy	239	NR, NR, mean 71.2 days	High satisfaction; favorable feedback (91.2%)
	NR	IM (3.8%) / IV, Central catheter (15.1%) / Peripheral catheter (43.1%) / Port (chest) (0.4%) / Port (arm) (15.9%) / PICC (0.4%), NR	NR
	Family member, nurse, physician		NR
Esposito [48]	Observational retrospective cohort	Bone and joint infections (48.9%), skin and soft tissue infections, other	Clinical control, cure, improvement (81.2%); failure (7.4%)
Outpatient Parenteral Antibiotic Therapy in the Elderly: an Italian Observational Multicenter Study	Hospital infusion centre (52.8%), care facility (2.8%), clinic (2.3%), home	NR	AEs (total 12.6%): rash (3.9%), fever (1.7%), itching (1.7%), renal impairment (1.1%), hepatic impairment (0.6%), diarrhea (0.6%), anaphylactoid reaction (0.6%), eosinophilia (0.6%), dizziness (0.6%), urticaria (0.6%), dyspnea and palpitations (0.6%)
		Teicoplanin (28.9%), ceftriaxone (22.1%)	
		NR, NR, NR	

2009	176	IM (3.9%) / IV, Peripheral catheter (56.8%) / central catheter (14.2%) / peripheral vein (13.1%) / Port (12.0%), NR, NR	NR
Journal of chemotherapy	NR		NR
	Family members, nurse, physician		NR
			Economic savings due to reduced personnel costs for careful clinical and drug monitoring
Esposito [49]	Observational retrospective cohort	Skin and soft tissue, pneumonia, other	Clinical cure, improvement (93.9% - 95.1%)
Changing modalities of outpatient parenteral antimicrobial therapy use over time in Italy: A comparison of two time periods	Infusion centre, home	NR	NR
	1175	Ceftriaxone, teicoplanin, and others	NR
2016	53.5 (mean)	NR, NR, Mean 40-56 days	NR
Infezioni in Medicina	Family members, nurse, physician	IM / other, NR, NR	NR
			NR
Giuliano [50]	Observational retrospective cohort	Urinary tract infection (23.8%), bloodstream infection (18.0%), acute bacterial skin and skin structure infection (13.4%), osteomyelitis (12.1%), endocarditis (9.2%), intra-abdominal infection (8.8%), head and neck infection (5.9%), pneumonia (5.9%), leishmaniasis (2.9%)	Clinical cure (94%); readmission within 30 days from the end of the ATB therapy (0%)
Outpatient parenteral antimicrobial therapy (OPAT) from an emergency model applied during the COVID-19 pandemic to standard of care: Preliminary lessons from our experience	Home, OPAT clinic		AEs: vascular catheter (thrombosis 5%) ATB-related (rash and itch 2%, elevation in liver function 2%, impaired renal function 4%, <i>Clostridium difficile</i> infection 1.3%)
	239	NR	
2023	63 (20-91) (median, IQR)	Ertapenem (28.5%), daptomycin (14.6%), ceftriaxone (13.8%), piperacillin/tazobactam (8.4%), dalbavancin (7.9%), teicoplanin (5.4%), cefepime (3.3%), liposomal amphotericin B (2.9%), amikacin (2.9%), oxacillin (2.1%), caspofungin (2.1%), meropenem (1.3%), colistin (1.3%), ceftazidime (0.8%), ceftazidime/avibactam (0.8%), acyclovir (0.4%), fluconazole (0.4%), gentamicin (0.4%)	NR
Infectious diseases now	General practitioner, infectious disease specialist, pharmacists, specialized nurses, vascular access team		NR
		NR, NR, mean 14 days	Good cost-effective OPAT profile that could bring down the costs of hospital management of infections
		IV, NR, elastomeric pump (18-21%)	
Giuliano [41]	Observational retrospective case series	Prosthetic joint infection (n=3), osteomyelitis (n=2), otomastoiditis (n=1), pneumonia (n=1)	Cure (86%); failure (N=1, 42.9%)
Effectiveness and safety of Ceftolozane/Tazobactam administered in continuous infusion through elastomeric pumps in OPAT regimen: a case series	Home, OPAT Clinic	<i>Pseudomonas aeruginosa</i> : MDR (71%), DTR (29%)	AEs: vascular catheter related (29%); CI of Ceftolozane/Tazobactam is safe and effective in practice
	7	Ceftolozane/tazobactam	NR
2024	67.5 (57-84) (median, IQR)	4.5g (29%) or 9g (71%), CI, median 37 days	NR
Infectious diseases	Infectious disease specialist / nurse / pharmacologist, caregiver	IV, vascular catheter, polyisoprene elastomeric pump	NR
			NR

Giuliano [51] Outpatient parenteral antibiotic therapy (OPAT) through elastomeric continuous infusion pumps in a real-life observational study: Characteristics, safety, and efficacy analysis 2024 Enfermedades infecciosas y microbiología clínica	Observational retrospective cohort Home, OPAT clinic 490 61 (46-75) (median, IQR) Infectious disease specialist, nurse, pharmacist	Bone and prosthetics (28.8%), acute bacterial skin and skin structure (14.9%), bloodstream (14.9%), head and neck (11.8%), intra-abdominal (9.6%), pneumonia (9.6%), urinary tract (7.5%), endocarditis (3.2%) <i>Pseudomonas aeruginosa</i> (48.3%), MSSA (11.4%), <i>Proteus</i> spp (7%), <i>Escherichia coli</i> (4.4%), <i>Enterobacter cloacae</i> (3.5%), <i>Enterococcus faecalis</i> (2.6%), <i>Providencia</i> spp (2.6%), <i>Bacteroides</i> spp. (2.6%), other (3.5%), polymicrobial (25.4%), no etiology (13.2%) Cefepime (34.0%), piperacillin/tazobactam (30.9%), ceftolozane/tazobactam (7.5%), oxacillin (7.5%), meropenem (6.4%), ceftazidime (3.2%), cefazolin (3.2%), colistin (3.2%), ceftazidime/avibactam (2.1%), acyclovir (2.1%) NR, 24h CI [except ceftazidime/avibactam (2h every 8h), meropenem (2.5h every 8h)], median 15 days IV, NR, polyisoprene elastomeric pump	Cure (88.3%); improvement (6.4%); relapse (2.1%); readmission (10.6%); failure (3.2%) AEs (total 12.8%: drug-related 6.4%, vascular catheter related 6.4%); OPAT through portable elastomeric infusion pumps proved is safe and effective NR NR NR Contribution to reduction of healthcare costs
Gonzalez-Ruiz [36] Outpatient and inpatient parenteral antibiotic therapy with daptomycin in a large non-interventional study: Reducing total therapy costs 2011 Clinical Microbiology and Infection, 21st European Society of Clinical Microbiology and Infectious Diseases/27th International Congress of Chemotherapy	Observational prospective cohort NR 86 NR NR	Osteomyelitis, cSSTI, other <i>Staphylococcus aureus</i> (MRSA rate 56%) Daptomycin Mean 5.5 mg/kg, 2-min each, median 14 days IV, NR, NR	Success rates were high AEs (19.2%) NR NR NR Reducing hospitalization has significant impact on overall health care costs
Lazzarini [39] Three-Times Weekly Teicoplanin in the Outpatient Treatment of Acute Methicillin-Resistant Staphylococcal Osteomyelitis: A Pilot Study 2002 Journal of Chemotherapy	Interventional prospective Hospital treatment unit 10 48±17.5 (mean, SD) NR	Acute post-traumatic osteomyelitis MR <i>Staphylococcus aureus</i>, MR coagulase-negative <i>staphylococci</i> Teicoplanin 400mg BID (first 3 days), 1000mg/day (twice a week), 1200mg/day (once a week), 30 min each, from 40 to 180 days IV, NR, NR	Clinical cure (90%); improvement (10%); failure (0%) No AEs (0%) NR Patient compliance was very high; administrations missed in OPAT (0.78%) NR NR
Lucioni [45] Outpatient prescribing patterns of antibiotics in Italy: Parenteral vs oral use (1993-2002) 2004	Observational retrospective ecological Community sales NR NR	Upper and lower respiratory tract, genitourinary diseases, other NR Cefepime, cefotaxime, ceftazidime, ceftizoxime, ceftriaxone, cefodizime, cefonicid, cefuroxime, cefazolin NR	NR NR NR NR

PharmacoEconomics	General practitioner	IM/IV, NR, NR	Outpatient use of injectable cephalosporins (1993-2002) averaged 0.6DDD/1000 inhabitants/day, peak of 0.8DDD/1000 inhabitants/day (1996-2000), decline in the subsequent years; the proportion of injectable cephalosporins decreased over time in favour of oral formulations Injectable cephalosporins have a higher cost (€20.8 per DDD in 2002) compared to oral antibiotics (fluoroquinolones: €3.7 per DDD; penicillins €1.1 per DDD)
Marvaso [52]	Observational retrospective cohort	Diabetic foot	Clinical cure (79%); improvement (10.5%); failure (10.5%)
Outpatient parenteral antibiotic therapy (OPAT) of diabetic foot infections with piperacillin/tazobactam	Home	<i>Staphylococcus aureus</i> , <i>Staphylococcus epidermidis</i> , <i>Enterococcus</i> spp, <i>Pseudomonas</i> spp	NR
2002	38	Piperacillin/tazobactam	NR
Infezioni in medicina	63, 34-76 (mean, range)	2.25g BID or 4.5g BID/TID, 15-28 days	NR
	NR	IM/IV, NR, NR	NR
Nigro [42]	Observational retrospective case series	Infective endocarditis	Clinical cure (100%)
Preliminary experience with O.P.A.T. (Outpatient Parenteral Antimicrobial-drug Therapy) in infective endocarditis	Infusion centre	<i>Streptococcus aureus</i> / <i>hominis</i> / <i>bovis</i> / <i>sanguis</i> / <i>mitis</i> , <i>Brucella</i> sp., <i>Candida</i> sp., <i>Enterobacter cloacae</i>	No AEs (0%)
2001	3	Ceftriaxone 2 gr/day, 30 days Gentamicin 3 mg/Kg/day, 15 days Teicoplanin 400 mg/day, 30 days	NR
Infezioni in medicina	43.2±14.2 (mean, SD)	IV, NR, N IV, NR, NR	High patient's compliance
	NR		NR
Pallotto [44]	Observational retrospective case report	Shoulder prosthetic joint	Follow up 5 months, no signs nor symptoms of infection were detected; surgical wound rapidly healed
Shoulder prosthetic joint infection due to <i>Pseudomonas aeruginosa</i> and carbapenem-resistant <i>Acinetobacter baumannii</i> treated with ciprofloxacin, minocycline and continuous infusion fosfomycin as OPAT regimen: a case report	NR	<i>Pseudomonas aeruginosa</i> , carbapenem-resistant <i>Acinetobacter baumannii</i>	NR
	1	Fosfomycin	NR
	85	20g/24h, CI, 14 weeks	NR
2025	Infectious diseases specialist	IV, PICC, elastomeric pump	NR
Journal of antimicrobial chemotherapy-antimicrobial resistance			NR
Restelli [37]	Observational retrospective cohort	Acute bacterial skin and skin structure, osteomyelitis, HAIs	Potential reduction in HAIs: from -55 to -129 events/year
Organisational and financial consequences of the early discharge of patients treated for acute bacterial skin and skin structure infection and osteomyelitis in infectious disease	Home care service	NR	NR
	5509	NR	NR
		NR, up to 2 weekly, NR	NR

departments in Greece, Italy and Spain: a scenario analysis	NR	IV, NR, NR	Potential hospital beds saved with OPAT: from 57 to 135/year; annual reduction of 16,393 to 38,990 hospital days
2019	Infectious disease specialist		Net budget impact for the Italian National healthcare System (costs): from -€182,132 to -€437,990 (savings)/year
British Medical Journal Open			
Versporten [38]	Observational retrospective ecological	NR	NR
European Surveillance of Antimicrobial Consumption (ESAC): outpatient cephalosporin uses in Europe (1997– 2009)	Community sales	NR	NR
	NR	Ceftriaxone (1.4%), cefazolin (1.0%), cefuroxime	NR
2011	NR	NR	NR
Journal of antimicrobial chemotherapy	NR	Parenteral, NR, NR	OPAT consumption: 0.7DDD/1000 inhabitants/day; the share of OPAT consumption in Italy is significantly higher than the European average
			NR

Legend. AE Adverse event; ATB Antibiotic; BID Bis in die; C Celsius; CI Continuous infusion; CNS Coagulase-Negative Staphylococci; cSSTI Complicated skin and soft tissue infections; DDD Defined Daily Dose; DTR Difficult to treat-resistant; g Gram; h Hour; HAI Healthcare-Associated Infection; IM Intramuscular; IQR Interquartile Range; IV Intravenous; mg Milligram; ml milliliter; MDR Multi-drug resistant; MR Methicillin-resistant; MRSA Methicillin-resistant *Staphylococcus aureus*; MSSA Methicillin-susceptible *Staphylococcus aureus*; NaCl Sodium Chloride; NR Not reported; OPAT Outpatient parenteral antibiotic therapy; PD Pharmacodynamic; PK Pharmacokinetic; PICC Peripherally implanted central catheter; SD Standard deviation; TID Ter in die; VRE Vancomycin-Resistant *Enterococcus*.