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Impact des propositions pour des antibiothérapies plus courtes de la Société de Pathologie Infectieuse de Langue Française (SPILF)

Impact of the French Infectious Diseases Society's (SPILF) proposals for shorter antibiotic therapies

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RESUME

Objectif. Comparer entre 2016 et 2018 les pratiques des spécialistes français des infections concernant les durées d'antibiothérapie.

Méthodes. Nous avons mené deux enquêtes identiques, une en 2016 et l'autre en 2018, visant les spécialistes hospitaliers des infections (médecins, pharmaciens) ayant une activité de conseil en antibiothérapie au minimum hebdomadaire. Le questionnaire était constitué de 15 vignettes cliniques correspondant à une situation clinique spécifique. La partie A visait à évaluer les durées d'antibiothérapie qu'ils conseillent habituellement aux cliniciens, la partie B recueillait les durées les plus courtes qu'ils seraient prêts à recommander pour les mêmes situations cliniques.

Résultats. Nous avons inclus 165 spécialistes en 2016 et 160 en 2018, majoritairement infectiologues (82 %, 268/325) et/ou membres d'une équipe multidisciplinaire en antibiothérapie (72 %, 234/325). Des durées courtes d'antibiothérapie (par rapport à la littérature) étaient conseillées aux prescripteurs dans plus de 50 % des vignettes par 71 % (105/147) des participants en 2018, contre 46 % (69/150) en 2016 ($p < 0,001$). Les guides de prescription utilisés par les participants utilisaient des durées d'antibiothérapie fixes dans 77 % (123/160) des cas en 2018 contre 21 % (35/165) en 2016. La quasi-totalité (89 %, 131/160) des participants à l'enquête 2018 disait connaître les propositions 2017 de la SPILF.

Conclusion. La publication des propositions SPILF 2017 sur les durées courtes d'antibiothérapie semble avoir eu un impact favorable sur les pratiques des professionnels faisant du conseil en antibiothérapie.

ABSTRACT

Objective. To compare the practices of French infection specialists related to antibiotic therapy duration between 2016 and 2018.

Methods. We conducted two identical surveys (in 2016 and 2018) targeting hospital-based infection specialists (medical physicians, pharmacists) who gave at least weekly advice on antibiotic prescriptions. The questionnaire included 15 clinical vignettes. Part A asked about the durations of antibiotic therapies they would usually advise to prescribers, and part B asked about the shortest duration they would be willing to advise for the same clinical situations.

Results. We included 325 specialists (165 in 2016 and 160 in 2018), mostly infectious disease specialists (82.4%, 268/325), members of antibiotic stewardship teams in 72% (234/325) of cases. Shorter antibiotic treatments (as compared with the literature) were advised to prescribers in more than half of the vignettes by 71% (105/147) of respondents in 2018, versus 46% (69/150) in 2016 ($p<0.001$). Guidelines used by participants displayed fixed durations for 77% (123/160) of cases in 2018 versus 21% (35/165) in 2016. Almost all respondents (89%, 131/160) declared they were aware of the 2017 SPILF's proposal.

Conclusion. The release of guidelines promoting shorter durations of antibiotic therapy seems to have had a favourable impact on practices of specialists giving advice on antibiotic prescriptions.

INTRODUCTION

Prescribing the shortest possible antibiotic therapy duration is a key component of the proper use of antibiotics [1–4]. Shorter antibiotic therapies do not negatively impact patients [5–13], and contribute to limiting the risk of antibiotics-related adverse effects. It may also limit the emergence of multidrug-resistant bacteria [14–16]. The French Infectious Diseases Society (French acronym SPILF) published a set of proposals in March 2017, based on a literature review, to promote shorter antibiotic therapies [17].

Most national and international guidelines recommend implementing multidisciplinary antimicrobial stewardship teams in hospital settings [4, 14, 18–20]. These teams are therefore best suited to promote shorter antibiotic therapies. However, no data is available on antibiotic therapy duration recommended to health professionals by infectious disease specialists giving advice on antibiotic prescriptions. We aimed to describe current practices in France, and to assess the potential impact of the 2017 SPILF's proposals.

METHODS

Study design

We present the results of two online surveys using the same method and an almost identical questionnaire. Both of these surveys assessed antibiotic therapy durations recommended to health professionals by infection specialists. The complete protocol has already been published [21]. Hospital-based physicians and pharmacists (fully trained or in training) giving at least weekly advice on antibiotic prescriptions (outside of their department) could participate in the survey. The first survey was conducted at the international level between

September 2016 and December 2016 – the overall results have already been published [21] – *i.e.*, before the publication of the SPILF’s proposals in March 2017 [17]. The second survey was only conducted in France between the end of January 2018 and March 2018. Invitations to participate were sent using the SPILF’s Infectioflash mailing list. The questionnaire was available on the SurveyMonkey® platform.

Questionnaire

The questionnaire was designed by a multidisciplinary group of experts in infectious diseases, microbiology, and public health, and was based on a literature review [17]. The questionnaire was first pilot tested with members of the SPILF’s and ESCMID’s working groups on antibiotic stewardship to check for clarity.

The questionnaire was divided into three parts (the English version of the complete questionnaire is available upon request to Pulcini *et al.* [21]). The first part aimed to collect information on respondents’ characteristics. The two subsequent parts assessed the usual practice of respondents in terms of antibiotic therapy duration recommendations made to health professionals for a specific clinical situation (A), and the shortest total duration they would be willing to recommend for the same cases (B). Parts A and B used clinical vignettes each one describing a specific clinical situation, assuming for each a “best case scenario”, *i.e.* that an appropriate antibiotic was prescribed (in terms of choice of molecule, dosing regimen, route of administration) and that the outcome was favorable with this treatment. The questionnaire of the second survey (2018) was identical to the one used for the first survey (2016), but it was translated into French and included four additional questions to assess knowledge and compliance with the proposals formulated by the SPILF in 2017 for shorter

antibiotic therapies [17]. The invitation mail only informed participants that the survey was about antibiotic therapy duration, with no mention of shorter duration.

As participation was anonymous, we cannot know whether some respondents to the 2016 survey also took part in the 2018 survey. No compensation was given to respondents.

Statistical analyses

Respondents' demographic and professional characteristics were first described as numbers and percentages. For each clinical vignette, the usually recommended duration of antibiotic therapy and the shortest duration that respondents were willing to recommend were presented as medians (days). For each clinical situation, short treatment durations were defined based on a literature review [17] and a consensus among all authors (details available in English from Pulcini *et al.* [21]). For each clinical vignette and each situation (duration of antibiotic therapy usually recommended or the shortest duration that respondents were willing to recommend), the percentages of respondents recommending short treatment durations as previously defined were calculated for 2016 and 2018 and then compared using the Chi-square test. Percentages of respondents usually recommending short antibiotic therapies for at least 50% of the vignettes were calculated for 2016 and 2018 and then compared. Respondents who failed to respond to more than seven clinical vignettes were excluded from the latter analysis. All comparisons were performed using the Chi-square test, with a significance threshold set at 5%. Analyses were performed using the SAS software, version 9.4 (SAS Institute, Inc., Cary, NC).

RESULTS

Sample characteristics

The total number of respondents to the first survey (2016) was 165 and 160 to the second survey (2018). The main characteristics of respondents are detailed in Table I. Professional characteristics were comparable in the two surveys, except for the “Member of an antimicrobial stewardship team” characteristic (66% in 2018 versus 79% in 2016, $p=0.01$). However, a higher proportion of respondents in 2018 than 2016 declared that the guidelines they refer to display fixed durations of antibiotic therapy (77% in 2018 versus 21% in 2016, $p<0.001$). A lower proportion of respondents practiced in university hospitals in 2018 (49%) than 2016 (60%). Almost all respondents (89%) to the 2018 survey declared being aware of the 2017 proposals of the SPILF, and most of them declared complying with such proposals in their daily practice.

Usual practice and shortest durations recommended

The respondents’ usual recommendations to health professionals regarding durations of antibiotic therapy and the shortest durations they would be willing to recommend for the same clinical situations are presented in Tables II and III. Medians related to usually recommended durations were shorter in 2018 than 2016 for 26% (4/15) of the vignettes and identical for the remaining vignettes. The same findings were observed for the shortest durations that respondents would be willing to recommend (shorter medians for 26% of the vignettes in 2018 versus 2016), with for instance a halved antibiotic therapy duration for acute pyelonephritis at risk of complication in women.

Comparison of practices between the two surveys

Percentages of respondents usually recommending a short treatment duration in 2016 and 2018, as well as comparisons, are presented in Table IV. Recommendations for short antibiotic

therapies highly varied by vignette, ranging from <3% of cases for the erysipelas vignette to >97% of cases for *Escherichia coli* uncomplicated spondylodiscitis in a patient without orthopedic implant. Respondents to the 2018 survey more often recommended short antibiotic therapies for 46% of the vignettes (7/15) compared with 2016, with only one case of longer antibiotic therapy recommended (*Staphylococcus aureus* uncomplicated catheter-related bacteremia). The proportion of respondents who recommended a short antibiotic therapy for at least 50% of the vignettes was 71% in 2018 versus 46% in 2016 ($p<0.001$).

Table V details the differences between 2016 and 2018 for the shortest durations that respondents would be willing to recommend. Respondents to the 2018 survey recommended short antibiotic therapies significantly more often than respondents to the 2016 survey for 40% of the vignettes (6/15).

DISCUSSION

Among all respondents to both surveys, 82% were infectious disease specialists and 72% were members of a multidisciplinary antimicrobial stewardship team. Almost 90% of respondents to the 2018 survey were aware of the SPILF's 2017 proposals for shorter antibiotic therapies [17]; 84% declared taking them into consideration when adapting treatment duration in their health facility and 90% in their daily practice. Seventy-seven per cent of respondents to the 2018 survey declared that the guidelines they referred to displayed fixed antibiotic therapy durations, as opposed to ranges. Treatment durations recommended by the 2018 respondents were substantially shorter than those recommended by respondents in 2016, even though the situation varied depending on the clinical vignettes. These findings thus

suggest that the 2017 SPILF's proposals had a significant impact, although no causal relation can be confirmed.

Short durations are heterogeneously complied with depending on the clinical situation, even though the latter are all mentioned in the 2017 SPILF's proposals. Ninety-three per cent of respondents recommended short treatment durations for diabetic foot ulcer and osteitis, without any indication for surgery; 95% for uncomplicated acute pyelonephritis treated with fluoroquinolones in a women; but only 24.5% for an outpatient with a community-acquired uncomplicated acute pneumonia; and 3% for uncomplicated erysipelas. The difficult clinical reevaluation associated with outpatient care (pneumonia, erysipelas) may lead physicians to recommend short treatment durations less frequently. Obstacles to the recommendation of short treatment duration depending on clinical situations should be further evaluated. Our data may however already be used to adjust the initial and continuing training of members of multidisciplinary antimicrobial stewardship teams (especially infectious disease specialists).

Our study presents original findings, but has several limitations. We could not calculate any response rate (for lack of a denominator, *i.e.* reliable data on the total number of eligible people who received the survey), but we obviously could not include all lead physicians or members of French multidisciplinary antimicrobial stewardship teams, and most respondents (54% for both studies) practiced in university hospitals. We therefore could not apply our results to the whole of France. Respondents may have been the best motivated and knowledgeable health professionals on the subject; our results may therefore be an optimistic presentation of the actual situation. Also, the international global results of our first survey [21] were available as "Advance Access only" on January 16, 2018, *i.e.* at the time of the second survey. We deliberately did not include such information in the invitation mail, but the

answers of respondents who had consulted such results may be biased. Although the use of clinical vignettes has been approved in assessing medical practices [21], it does not necessarily reflect the actual practices of respondents.

CONCLUSION

Our study results suggest that most infection specialists in France take into consideration the latest proposals from the SPILF on shorter antibiotic therapies.

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Disclosure of interests

The authors declare no conflict of interests.

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Tableau I. Caractéristiques des participants / **Table I.** Characteristics of respondents

		Respondents			
		2016		2018	
		N	%	N	%
Frequency of antibiotic prescription advice to colleagues or family physicians	Yes, every day	110	66.7	108	67.5
	Yes, at least once a week	55	33.3	52	32.5
Sex	Male	89	54.3	84	52.8
	Female	75	45.7	75	47.2
	Missing data	1		1	
Age	<30 years	16	9.8	13	8.1
	30-50 years	113	68.9	108	67.5
	>50 years	35	21.3	39	24.4
	Missing data	1			
Health facility	University hospital	98	59.8	78	49.1
	Other public hospital	53	32.3	67	42.1
	Private hospital/clinic	11	6.7	10	6.3
	Other	2	1.2	4	2.5
	Missing data	1		1	
Specialty	Infectious diseases	134	81.7	134	83.8
	Microbiology	6	3.7	2	1.3
	Pharmacy	1	0.6	2	1.3
	Other	23 ^a	14.0	22 ^b	13.8
	Missing data	1			
Years of practice within current specialty	0-5 years	44	26.8	47	29.4
	6-10 years	31	18.9	41	25.6
	>10 years	73	44.5	61	38.1
	I am currently undertaking my specialty training	15	9.1	11	6.9
	I haven't started my specialty training	1	0.6		
	Missing data	1			
Member of an antimicrobial stewardship team	Yes	128	79.0	106	66.3
	No	34	21.0	54	33.8
	Missing data	3			
Presentation of durations of antibiotic therapy in the guidelines referred to	Range (e.g., 5-10 days)	130	78.8	36	22.6
	Fixed duration (e.g., 5 days)	35	21.2	123	77.4
	Missing data			1	
Knowledge of the 2017 SPILF's proposals for shorter antibiotic therapies*	Yes			131	89.1
	No			16	10.9
	Missing data			13	

Consideration of the SPILF's proposals when adapting treatment durations from local/regional guidelines*	No, we are not planning on integrating such proposals in our guidelines	1	0.7
	No, but we are planning to	21	16.3
	Yes, we shortened antibiotic therapy durations	71	55.0
		36	28.0
	Yes, we no longer use ranges of treatment duration	3	
	Missing data		
Use of short treatment durations mentioned in the SPILF's proposals in your daily practice*	Yes, sometimes	13	9.9
	Yes, often	61	46.6
	Yes, almost all the time	57	43.5
	No	0	0

^a Main specialties: intensive care medicine (39.1%, 9/23), pediatrics (30.4%, 7/23), internal medicine (13%, 3/23)

^b Main specialties: pediatrics (27.2%, 6/22), general medicine (18.1%, 4/22), intensive care medicine (13.6%, 3/22)

* Question only asked in 2018

Tableau II. Durées d'antibiothérapie habituellement recommandées proposées par les participants pour les 15 vignettes cliniques (enquêtes 2016 et 2018)

Table II. Antibiotic therapy duration usually recommended for the 15 clinical vignettes (2016 and 2018 surveys)

Clinical vignette	Duration of antibiotic therapy usually recommended (2016)				Duration of antibiotic therapy usually recommended (2018)			
	N	Median (days)	Would not prescribe an antibiotic (%)	Not applicable to my practice (%)	N	Median (days)	Would not prescribe an antibiotic (%)	Not applicable to my practice (%)
Child or adolescent with <i>Neisseria meningitidis</i> meningitis	156	7	0	5.8	152	5	2.0	7.2
Patient with acute cholecystitis, successfully and rapidly treated by endoscopic biliary drainage	156	7	0	4.5	150	5	1.3	5.3
Patient with diffuse peritonitis, with adequate and rapid surgery	155	7	0	4.5	150	5	0.7	3.3
Woman with uncomplicated acute pyelonephritis (if a fluoroquinolone is prescribed)	156	7	0	2.6	151	7	0	1.3
Woman with acute pyelonephritis at risk of complication	156	10	0	2.6	150	10	0	2.0
Outpatient with community-acquired uncomplicated acute pneumonia	153	7	0	1.3	148	7	0	1.4
Patient with an acute exacerbation of COPD	153	5	4.6	3.9	150	5	2.7	5.3
Patient with uncomplicated catheter-related <i>Staphylococcus aureus</i> bacteremia	153	14	0	1.3	148	14	0	0.7
Patient with uncomplicated catheter-related <i>Klebsiella pneumoniae</i> bacteremia	152	7	0	1.3	149	7	0	1.3
Patient with uncomplicated <i>Escherichia coli</i> spondylodiscitis, without orthopedic implant	153	42	1.3	2.6	150	42	0	4.0
	152	42	1.3	9.9	147	42	0	8.2

Patient with diabetic foot ulcer and osteitis, not eligible for surgery

Patient with uncomplicated staphylococcal prosthetic infection, managed with one-stage exchange	152	42	0.7	7.2	146	42	0.7	6.2
Patient with uncomplicated erysipelas	152	10	0	0.7	149	7	0	0.7
Child (>2 years) with a first episode of purulent acute otitis media	152	5	11.8	18.4	148	5	6.8	28.4
Adult with uncomplicated maxillary sinusitis of suspected bacterial origin	151	7	6.0	6.6	148	7	4.0	7.4

COPD: chronic obstructive pulmonary disease

Tableau III. Durées les plus courtes proposées par les participants pour les 15 vignettes cliniques (enquêtes 2016 et 2018)

Table III. Shortest durations the respondents would be willing to recommend for the 15 clinical vignettes (2016 and 2018 surveys)

Clinical vignette	Shortest duration recommended (2016)				Shortest duration recommended (2018)			
	N	Median (days)	Would not prescribe an antibiotic (%)	Not applicable to my practice (%)	N	Median (days)	Would not prescribe an antibiotic (%)	Not applicable to my practice (%)
Child or adolescent with <i>Neisseria meningitidis</i> meningitis	146	5	0	4.1	144	5	0.7	6.3
Patient with acute cholecystitis, successfully and rapidly treated by endoscopic biliary drainage	144	5	0.7	2.1	143	3	2.8	4.2
Patient with diffuse peritonitis, with adequate and rapid surgery	145	5	0	3.4	143	4	0.7	3.5
Woman with uncomplicated acute pyelonephritis (if a fluoroquinolone is prescribed)	145	7	0	2.1	143	7	0	1.4
Woman with acute pyelonephritis at risk of complication	145	14	0	2.1	143	7	0	2.1
Outpatient with community-acquired uncomplicated acute pneumonia	142	5	7.0	3.5	144	5	0.7	0.7
Patient with an acute exacerbation of COPD	146	5	0	0	144	5	6.9	4.9
Patient with uncomplicated catheter-related <i>Staphylococcus aureus</i> bacteremia	146	10	0.7	0	143	10	0	0.7
Patient with uncomplicated catheter-related <i>Klebsiella pneumoniae</i> bacteremia	143	7	1.4	0	142	7	0	1.4
Patient with uncomplicated <i>Escherichia coli</i> spondylodiscitis, without orthopedic implant	146	42	0	3.4	144	42	0	4.2
	142	42	1.4	8.5	141	35	0.7	6.4

Patient with diabetic foot ulcer and osteitis, not eligible for surgery

Patient with uncomplicated staphylococcal prosthetic infection, managed with one-stage exchange	144	42	0	6.9	144	42	0.7	5.6
Patient with uncomplicated erysipelas	142	7	0	0	144	7	0	0.7
Child (>2 years) with a first episode of purulent acute otitis media	143	5	15.4	15.4	144	5	9.0	27.1
Adult with uncomplicated maxillary sinusitis of suspected bacterial origin	144	5	9.7	6.3	143	5	4.9	5.6

COPD: chronic obstructive pulmonary disease

Tableau IV. Comparaison 2016-2018 du pourcentage de traitements courts recommandés pour chaque vignette (pratique habituelle)

Table IV. 2016-2018 comparison of percentages of short treatments recommended for each vignette (usual practice)

	2016 N=165		2018 N=160		p
	N	%	N	%	
Child or adolescent with <i>Neisseria meningitidis</i> meningitis					
Long treatment	78	53.1	66	47.8	0.377
Short treatment	69	46.9	72	52.2	
Missing data	18		22		
Patient with acute cholecystitis, successfully and rapidly treated by endoscopic biliary drainage					
Long treatment	136	91.3	95	67.9	<0.001
Short treatment	13	8.7	45	32.1	
Missing data	16		20		
Patient with diffuse peritonitis, with adequate and rapid surgery					
Long treatment	127	85.8	110	76.4	0.039
Short treatment	21	14.2	34	23.6	
Missing data	17		16		
Woman with uncomplicated acute pyelonephritis (if a fluoroquinolone is prescribed)					
Long treatment	13	8.6	7	4.7	0.179
Short treatment	139	91.4	142	95.3	
Missing data	13		11		
Woman with acute pyelonephritis at risk of complication					
Long treatment	75	49.3	26	17.7	<0.001
Short treatment	77	50.7	121	82.3	
Missing data	13		13		
Outpatient with community-acquired uncomplicated acute pneumonia					
Long treatment	133	88.1	110	75.3	0.004
Short treatment	18	11.9	36	24.7	
Missing data	14		14		
Patient with an acute exacerbation of COPD					
Long treatment	55	39.3	47	34.1	0.365
Short treatment	85	60.7	91	65.9	
Missing data	25		22		
Patient with uncomplicated catheter-related <i>Staphylococcus aureus</i> bacteremia					
Long treatment	91	60.3	108	73.5	0.015
Short treatment	60	39.7	39	26.5	
Missing data	14		13		
Patient with uncomplicated catheter-related <i>Klebsiella pneumoniae</i> bacteremia					
Long treatment	70	46.7	41	27.9	< 0.001
Short treatment	80	53.3	106	72.1	
Missing data	15		13		
Patient with uncomplicated <i>Escherichia coli</i> spondylodiscitis, without orthopedic implant					
Long treatment	4	2.7	3	2.1	1
Short treatment	143	97.3	141	97.9	
Missing data	18		16		
Patient with diabetic foot ulcer and osteitis, not eligible for surgery					
	27	20.0	9	6.7	0.001
		80.0		93.3	

Long treatment	108		126		
Short treatment	30		25		
Missing data					
Patient with uncomplicated staphylococcal prosthetic infection, managed with one-stage exchange					
Long treatment	57	40.7	33	24.3	0.003
Short treatment	83	59.3	103	75.7	
Missing data	25		24		
Patient with uncomplicated erysipelas					
Long treatment	147	97.4	144	97.3	1
Short treatment	4	2.6	4	2.7	
Missing data	14		12		
Child (>2 years) with a first episode of purulent acute otitis media					
Long treatment	44	41.5	36	37.5	0.560
Short treatment	62	58.5	60	62.5	
Missing data	59		64		
Adult with uncomplicated maxillary sinusitis of suspected bacterial origin					
Long treatment	83	62.9	75	56.8	0.315
Short treatment	49	37.1	57	43.2	
Missing data	33		28		

COPD: chronic obstructive pulmonary disease

Table V. 2016-2018 comparison of percentages of shortened durations for each vignette (shortest possible duration)

Tableau V. Comparaison 2016-2018 du pourcentage de traitements courts à chaque vignette (durée la plus courte possible)

	2016 N=165		2018 N=160		
	N	%	N	%	<i>p</i>
Child or adolescent with <i>Neisseria meningitidis</i> meningitis					
Long treatment	39	27.9	31	23.1	0.370
Short treatment	101	72.1	103	76.9	
Missing data	25		26		
Patient with acute cholecystitis, successfully and rapidly treated by endoscopic biliary drainage					
Long treatment	113	80.7	59	44.4	<0.001
Short treatment	27	19.3	74	55.6	
Missing data	25		27		
Patient with diffuse peritonitis, with successful and rapid surgery					
Long treatment	90	64.3	68	49.6	0.014
Short treatment	50	35.7	69		
Missing data	25		23	50.4	
Woman with uncomplicated acute pyelonephritis (if a fluoroquinolone is prescribed)					
Long treatment	7	4.9	2	1.4	0.173
Short treatment	135	95.1	139	98.6	
Missing data	23		19		
Woman with acute pyelonephritis at risk of complication					
Long treatment	74	52.1	6	4.3	<0.001
Short treatment	78	47.9	134	95.7	
Missing data	23		19		
Outpatient with community-acquired uncomplicated acute pneumonia					
Long treatment	19	15.0	32	22.5	0.114
Short treatment	108	85.0	110	77.5	
Missing data	38		18		
Patient with an acute exacerbation of COPD					
Long treatment	52	35.6	7	5.5	<0.001
Short treatment	94	64.4	120	94.5	
Missing data	19		33		
Patient with uncomplicated catheter-related <i>Staphylococcus aureus</i> bacteremia					
Long treatment	47	32.4	50	35.2	0.616
Short treatment	98	67.6	92	64.8	
Missing data	20		18		
Patient with uncomplicated catheter-related <i>Klebsiella pneumoniae</i> bacteremia					
Long treatment	38	27.0	20	14.3	0.009
Short treatment	103	73.0	120	85.7	
Missing data	24		20		
Patient with uncomplicated <i>Escherichia coli</i> spondylodiscitis, without orthopedic implant					
Long treatment	3	2.1	0	0	0.247
Short treatment	138	97.9	138	100	
	24		22		

Missing data					
Patient with diabetic foot ulcer and osteitis, not eligible for surgery					
Long treatment	14	10.9	1	0.8	< 0.001
Short treatment	114	89.1	130	99.2	
Missing data	37		29		
Patient with uncomplicated staphylococcal prosthetic infection, managed with one-stage exchange					
Long treatment	17	12.7	17	12.6	0.981
Short treatment	117	87.3	118	87.4	
Missing data	31		25		
Patient with uncomplicated erysipelas					
Long treatment	102	71.8	100	69.9	0.724
Short treatment	40	28.2	43	30.1	
Missing data	23		23		
Child (>2 years) with a first episode of purulent acute otitis media					
Long treatment	17	17.2	14	15.2	0.714
Short treatment	82	82.8	78	84.8	
Missing data	66		68		
Adult with uncomplicated maxillary sinusitis of suspected bacterial origin					
Long treatment	31	25.6	28	21.9	0.487
Short treatment	90	74.4	100	78.1	
Missing data	44		32		

COPD: chronic obstructive pulmonary disease