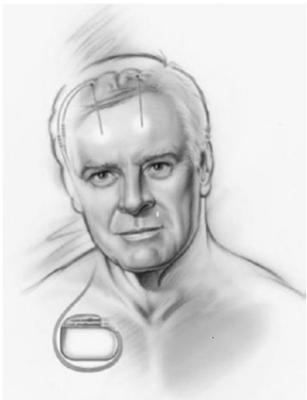


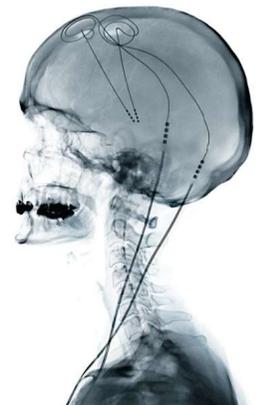
Infections sur matériel de stimulation intracérébrale

Séverine Ansart (Brest), Matthieu Revest (Rennes)



DESC Pathologies infectieuses et tropicales

Paris, le 29 janvier 2018



La stimulation cérébrale profonde

- 1987: maladie de Parkinson
- Depuis: extension des indications
 - Tremblements et autres mouvements anormaux
 - Dystonies
 - Troubles obsessionnels compulsifs
 - Dépression sévère
 - Comportements addictifs
- Infections de matériel: pas de recommandation

Management of hardware infections following deep brain stimulation

Y. Temel¹, L. Ackermans¹, H. Celik², G. H. Spincemaille¹, C. van der Linden³, G. H. Walenkamp⁴, T. van de Kar⁵, and V. Visser-Vandewalle¹

¹ Department of Neurosurgery, University Hospital Maastricht, Maastricht, The Netherlands

² Faculty of Health Sciences, University of Maastricht, Maastricht, The Netherlands

³ Movement Disorders Centre, St. Lucas Hospital Ghent, Ghent, Belgium

⁴ Department of Orthopaedic Surgery, University Hospital Maastricht, Maastricht, The Netherlands

⁵ Department of Plastic and Reconstructive Surgery, University Hospital Maastricht, Maastricht, The Netherlands

Table 3. Overview of infection rates in publications on deep brain stimulation

Research group*	Publication year	Number of stimulated patients	Journal	Infection rate**
Benabid <i>et al.</i> [3]	1998	197	Movement Disorders	1.5%
Kumar <i>et al.</i> [10]	1997	68	Neurosurgery	5.9%
Levy <i>et al.</i> [13]	1987	114	Neurosurgery	16.3%
Limousin <i>et al.</i> [14]	1999	110	J Neurology Neurosurgery Psychiatry	1.8%
Lyons <i>et al.</i> [15]	2001	206	Neurology	2.5%
Obeso <i>et al.</i> [18]	1998	36	Movement Disorders	22.2%
Oh <i>et al.</i> [19]	2002	79	Neurosurgery	8.8%
Pahwa <i>et al.</i> [20]	2001	50	Neurology	6.9%
Pollak <i>et al.</i> [21]	2002	300	Movement Disorders	3.3%
Present study	2003	106		3.8%

* The references are listed in the bibliography.

** Infection rates refer to the percentage of patients who developed DBS hardware-related infection within the study group.

La stimulation cérébrale profonde

- Prise en charge actuelle:
 - Recommandation sur infection de matériel de stimulation endocavitaire (pace-maker, défibrillateur)
 - Recommandation sur infection de dérivation de LCS



La stimulation cérébrale profonde

European Heart Journal
doi:10.1093/eurheartj/ehv319

ESC GUIDELINES

2015 ESC Guidelines for the management of infective endocarditis

The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC)

Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Cardiothoracic Surgeons (EACTS), the European Association of Nuclear Medicine (EANM)

ESC 2015

Eur Heart J, 2015

AHA Scientific Statement

Update on Cardiovascular Implantable Electronic Device Infections and Their Management

A Scientific Statement From the American Heart Association

Endorsed by the Heart Rhythm Society

Larry M. Baddour, MD, FAHA, Chair; Andrew E. Epstein, MD, FAHA; Christopher C. Erickson, MD, FAHA; Bradley P. Knight, MD, FHRS; Matthew J. Price, MD, FAHA; Peter B. Lockhart, DDS; Frederick A. Masoudi, MD, MSPH; Eric D. Peterson, MD, FAHA; Walter R. Wilson, MD; Lee B. Beerman, MD; Ann F. Bolger, MD, FAHA; N.A. Mark Estes III, MD, FAHA, FHRS; Michael Gewirtz, MD, FAHA; Jane W. Newburger, MD, MPH, FAHA; Eleanor B. Schron, PhD, FAHA

AHA 2010

Circulation, 2010

J Antimicrob Chemother 2015; **70**: 325–359
doi:10.1093/jac/dku383 Advance Access publication 29 October 2014

Journal of Antimicrobial Chemotherapy

Guidelines for the diagnosis, prevention and management of implantable cardiac electronic device infection. Report of a joint Party project on behalf of the British Society for Antimicrobial Chemotherapy (BSAC, host organization), British Heart Foundation (BHS), British Cardiovascular Society (BCS), British Society for Antimicrobial Chemotherapy (BSAC), British Society for Infection (BSI), British Society for Hospital Infection (BSHI), British Society for Microbiology (BSM), British Society for Mycology (BSMyc), British Society for Paediatric Infection (BSPI), British Society for Public Health (BSPH), British Society for Rheumatology (BSR), British Society for Sexual Health (BSH), British Society for Venereal Diseases (BSVD), British Society for Venous Medicine (BSVM), British Society for Venous and Lymphatic Medicine (BSVLM), British Society for Venous and Lymphatic Medicine (BSVLM), British Society for Venous and Lymphatic Medicine (BSVLM) and British Society for Echocardiography (BSE).

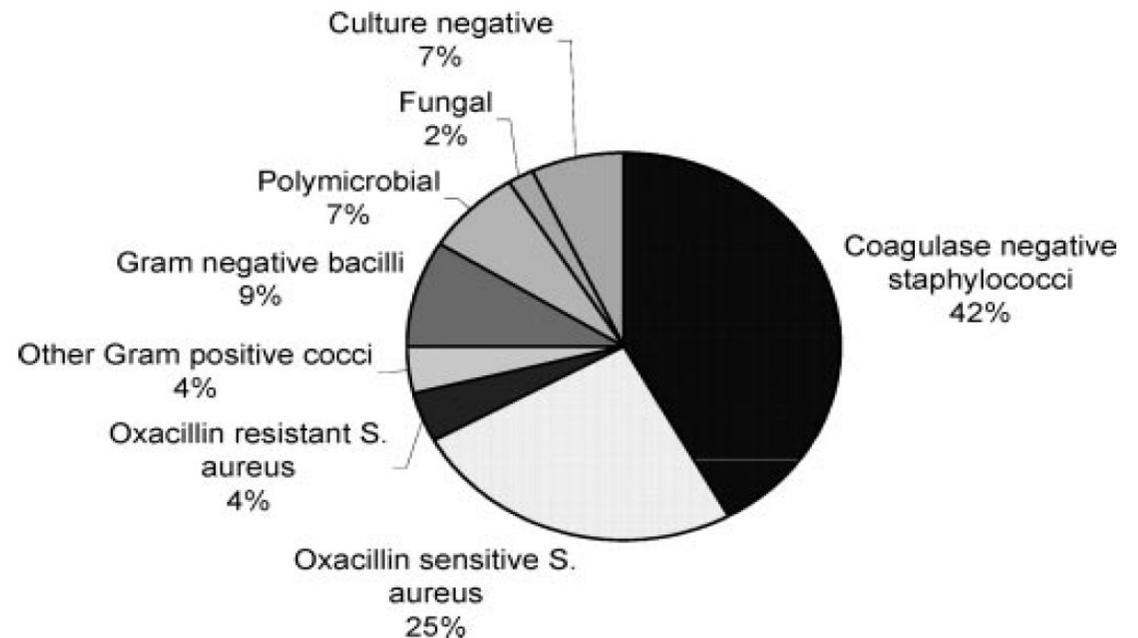
BSAC 2015

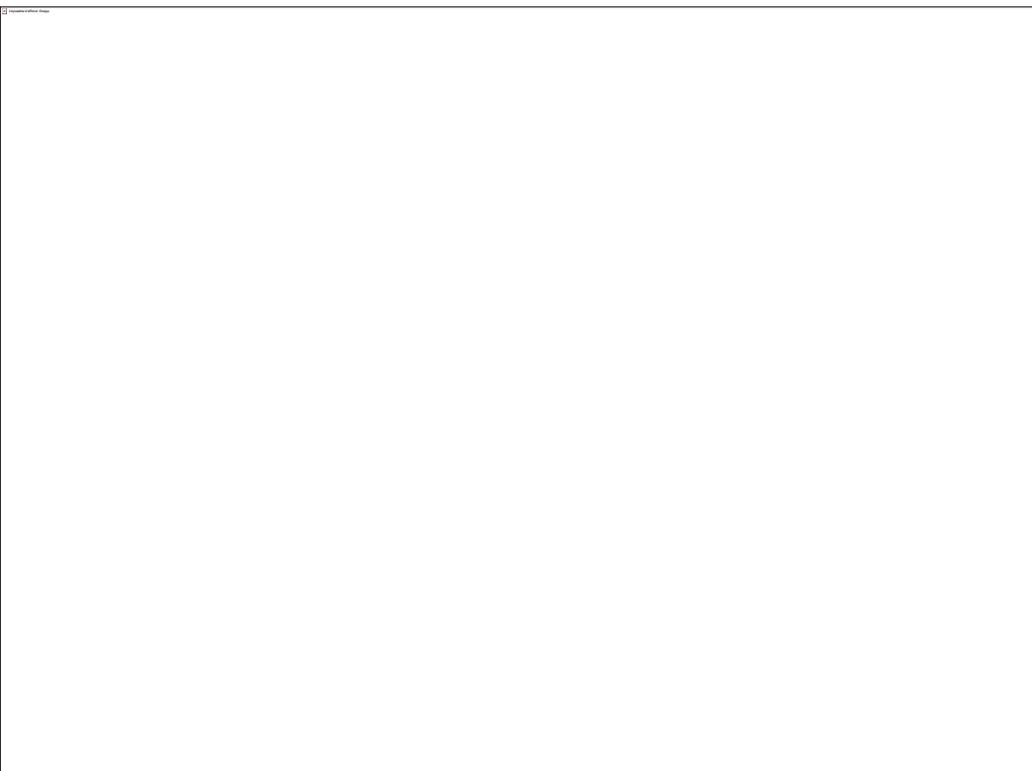
JAC, 2015

Infection sur pace maker et défibrillateurs

Microbiologie

- Staphylocoques coagulase neg. 40%
- *Staphylococcus aureus* 30%
 - SAMS 25%
 - SARM 5%
- Autres cocci Gram pos. 5%
- Bacilles Gram neg. 10%
- Polymicrobien 7%
- Culture négative 7%





Clinical Infectious Diseases 2011,52(8):1020–1023

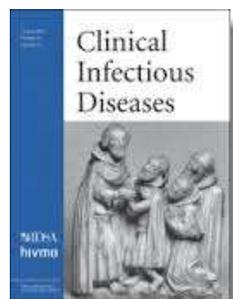
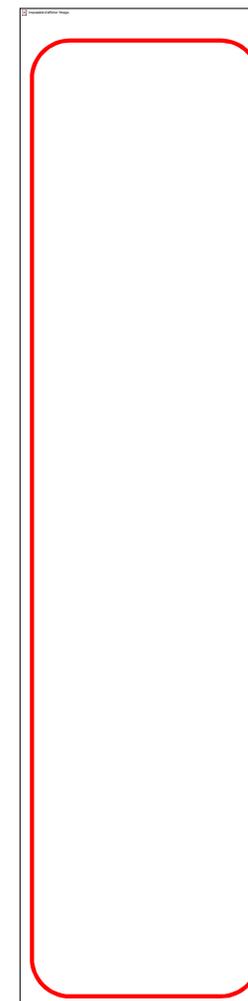
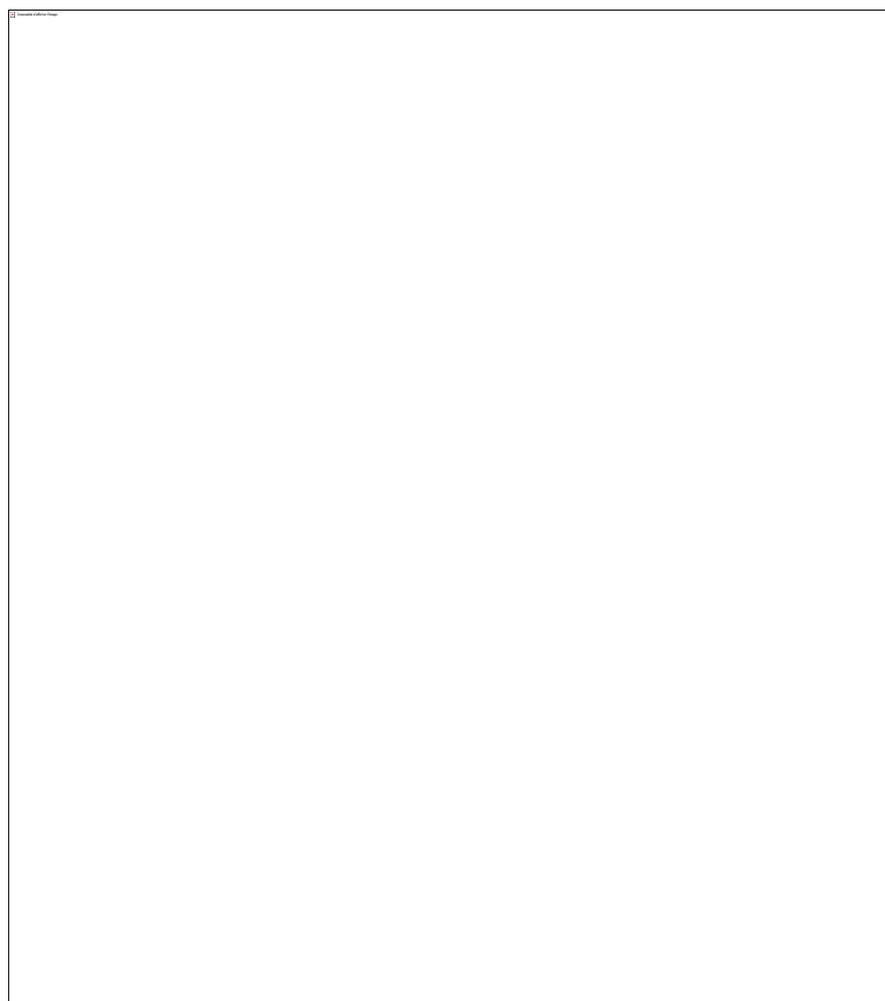
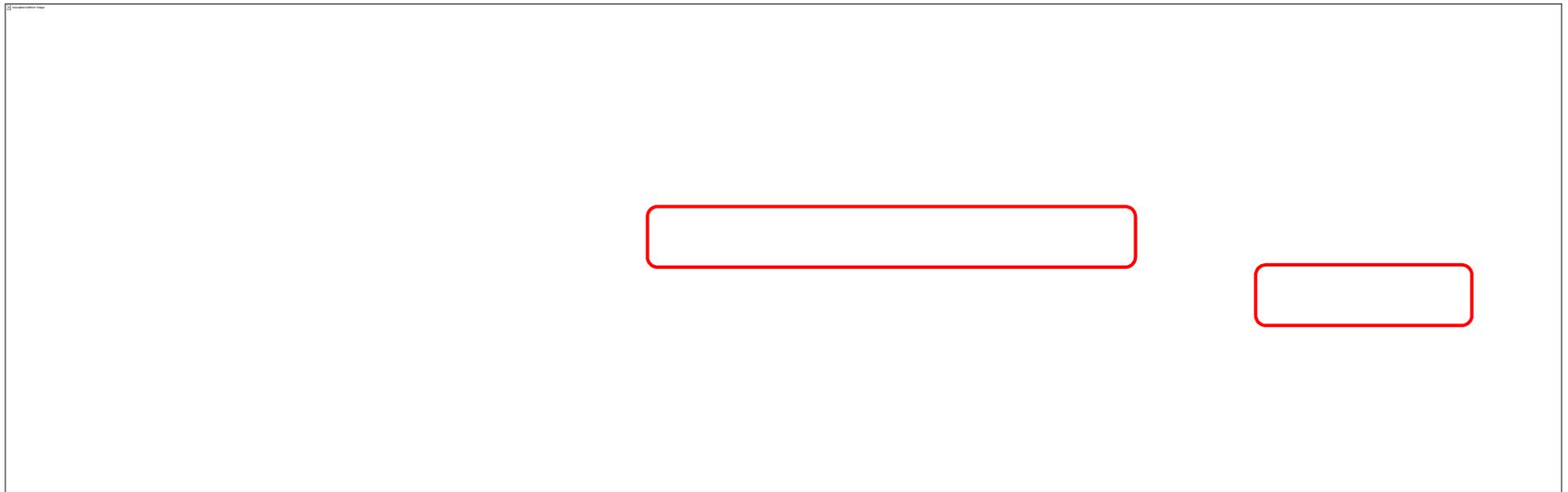
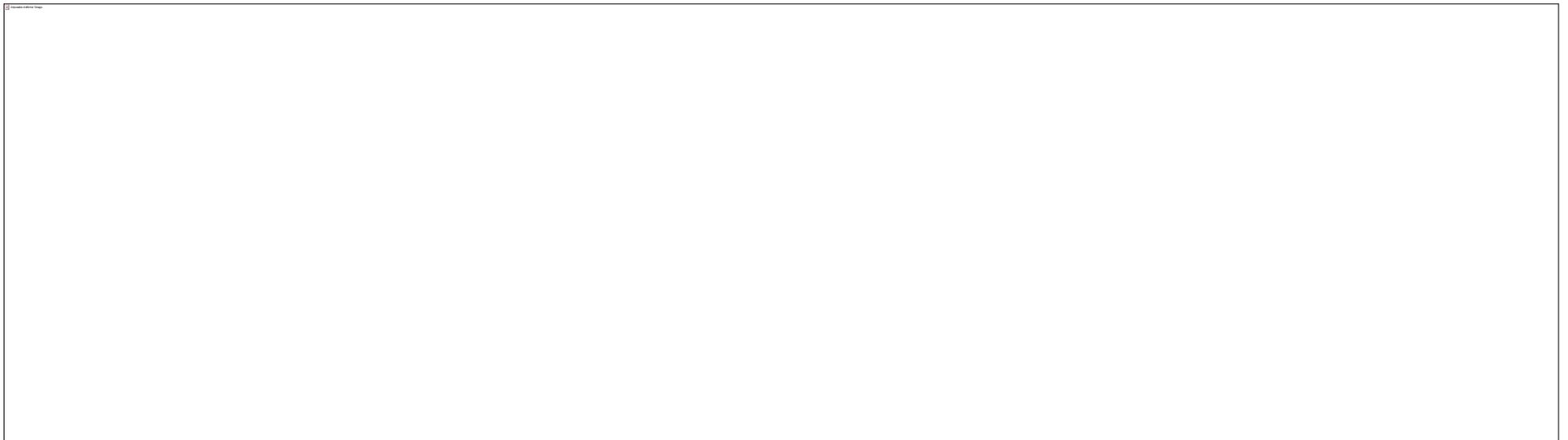


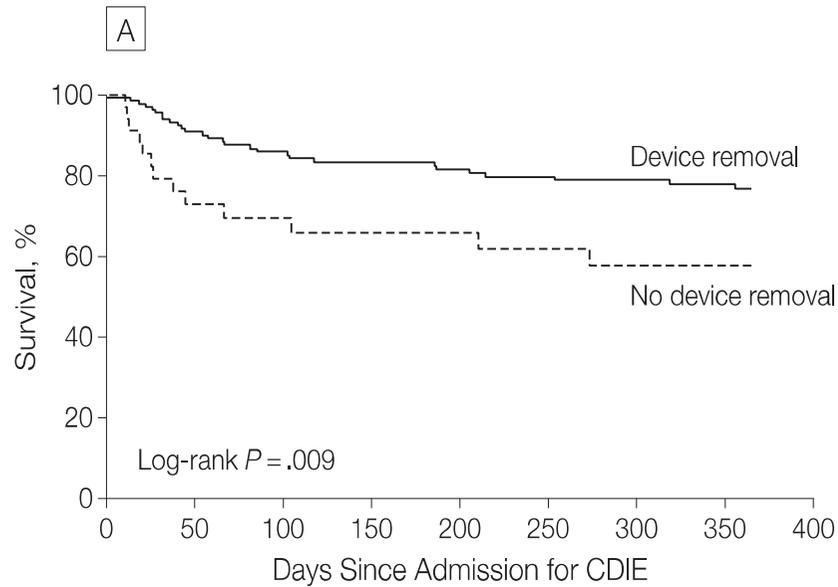
Table 1. Deep Brain Stimulation Hardware-Related Infections at Rennes University Hospital, 2006–2008



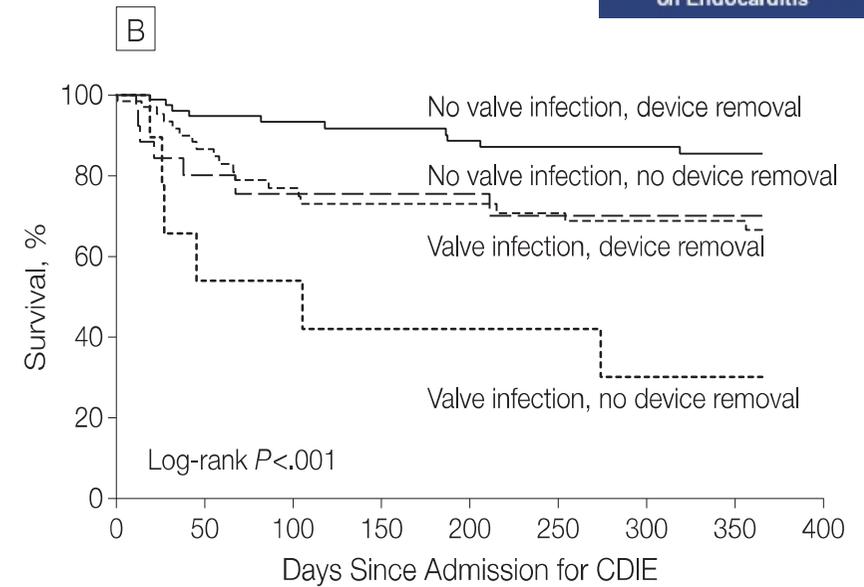
Infection sur pace maker et défibrillateurs



Figure 2. Outcome of Patients With Cardiac Device Infective Endocarditis (CDIE)



No. at risk	0	50	100	150	200	250	300	350	400
Device removal	141	112	98	94	92	87	84	80	
No device removal	34	22	19	17	16	14	13	12	



No. at risk	0	50	100	150	200	250	300	350	400
No valve infection									
Device removal	79	66	61	59	57	54	53	50	
No device removal	25	18	15	14	13	11	11	10	
Valve infection									
Device removal	62	46	37	35	35	33	31	30	
No device removal	9	4	4	3	3	3	2	2	

82 Underwent device removal

32 Underwent device removal

15 Underwent device removal

12 Underwent device removal

Device removal was performed during the index hospitalization.

CT finding at admission	Serum CRP level, mg/L
Abscess	1
Normal	108
Not done	30
Oedema	48
Oedema	1.8
Normal	20
Normal	130
Normal	3.3
Not done	5
Not done	31
Normal	3
Not done	NA

Fièvre:

- 3/12, max 38,5° C

Examen neuro:

- anormal 1/12
(confusion)

Hémocultures:

- Toutes stériles

Table 1. Deep Brain Stimulation Hardware-Related Infections at Rennes University Hospital, 2006-2008

- Nécessité d'ablation complète du matériel si
 - infection intracrânienne
 - signes infectieux le long de la cicatrice frontale
- Possible ablation partielle si
 - atteinte unique du stimulateur
 - Sous couvert d'une antibiothérapie prolongée
- Antibiothérapie prolongée 2 à 6 semaines après extraction
 - 6 semaines si infection neuroméningée associée

Surgical Site Infections after Deep Brain Stimulation Surgery: Frequency, Characteristics and Management in a 10-Year Period

Silje Bjerknæs^{1*}, Inger Marie Skogseid¹, Terje Sæhle², Espen Dietrichs^{1,3}, Mathias Toft¹

¹ Department of Neurology, Oslo University Hospital, Oslo, Norway, ² Department of Neurosurgery, Oslo University Hospital, Oslo, Norway, ³ Faculty of Medicine, University of Oslo, Oslo, Norway

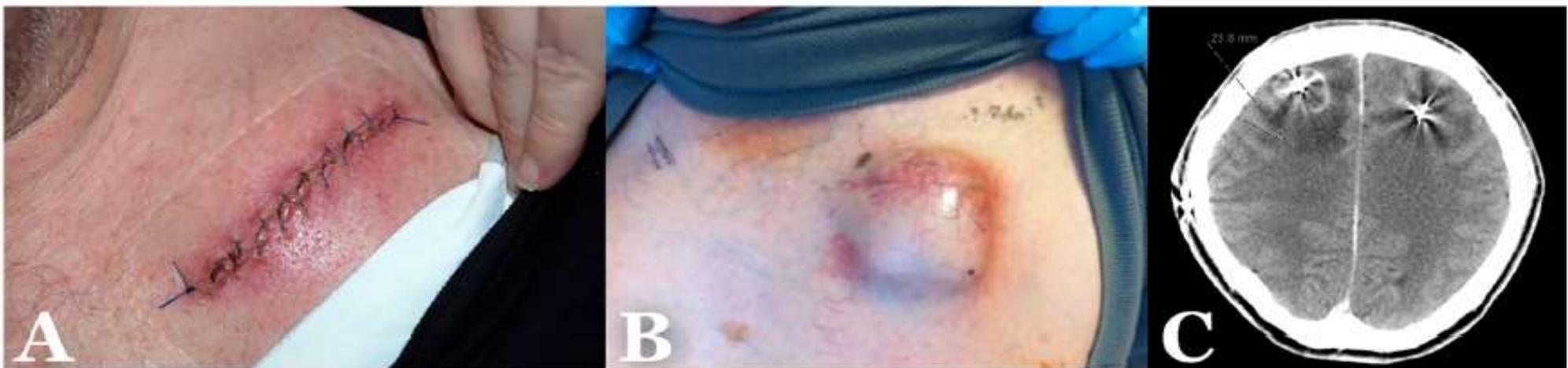


Figure 1. Examples on the different types of infection. A) Superficial incisional SSI. B) Deep incisional SSI. C) Organ/space SSI. (SSI = surgical site infection).

Attitude conservatrice dans 7/33 (21%)
 Explantation partielle dans 22/33 (67%)
 Explantation totale dans 4/33 (12%)

2017 Infectious Diseases Society of America's Clinical Practice Guidelines for Healthcare-Associated Ventriculitis and Meningitis*

CID 2017:64 (15 March)

Allan R. Tunkel,¹ Rodrigo Hasbun,² Adarsh Bhimraj,³ Karin Byers,⁴ Sheldon L. Kaplan,⁵ W. Michael Scheld,⁶ Diederik van de Beek,⁷ Thomas P. Bleck,⁸ Hugh J. L. Garton,⁹ and Joseph R. Zunt¹⁰

Table 1. Recommended Antimicrobial Therapy in Patients With Healthcare-Associated Ventriculitis and Meningitis Based on Isolated Pathogen and In Vitro Susceptibility Testing

Microorganism	Standard Therapy	Alternative Therapies
Staphylococci ^a		
Methicillin sensitive	Nafcillin or oxacillin	Vancomycin
Methicillin resistant	Vancomycin	Daptomycin, trimethoprim-sulfamethoxazole, or linezolid

^aAdd rifampin if organism is susceptible and prosthetic material is also in place.

2017 Infectious Diseases Society of America's Clinical Practice Guidelines for Healthcare-Associated Ventriculitis and Meningitis*

CID 2017:64 (15 March)

Allan R. Tunkel,¹ Rodrigo Hasbun,² Adarsh Bhimraj,³ Karin Byers,⁴ Sheldon L. Kaplan,⁵ W. Michael Scheld,⁶ Diederik van de Beek,⁷ Thomas P. Bleck,⁸ Hugh J. L. Garton,⁹ and Joseph R. Zunt¹⁰

IX. What is the Role of Catheter Removal in Patients with Cerebrospinal Fluid Shunts or Drains?

Recommendations

62. Complete removal of an infected CSF shunt and replacement with an external ventricular drain combined with intravenous antimicrobial therapy is recommended in patients with infected CSF shunts (strong, moderate).