# Infections sur Chambres Implantables

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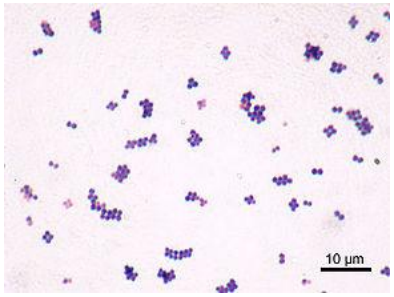


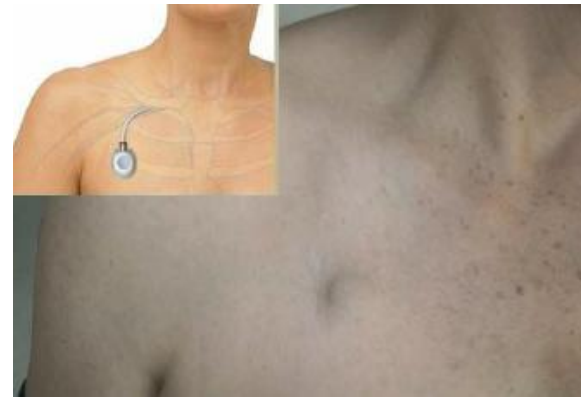

Session commune paramédicale et médicale

33èmes journées du Géricco

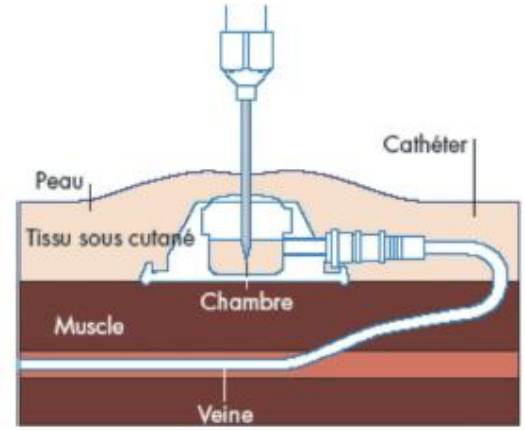
Roiffé, le 28 mars 2013

# Les chambres implantables

- **Nombre de poses important:**
  - **En 2006, 40 000 poses en France (source HAS)**

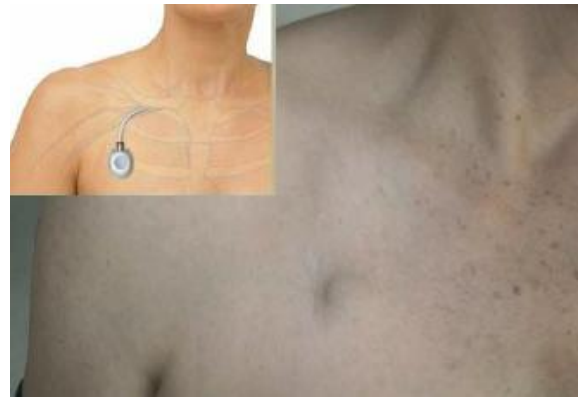


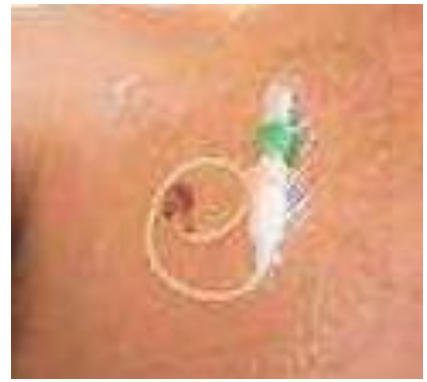
- **Indications:**
  - **Oncologiques: chimiothérapies +++**
  - **Nutrition parentérale**
  - **Antibiothérapie prolongée**
  - **Toute perfusion répétée**



# Les chambres implantables

- **Avantages théoriques face à un cathéter tunnelisé:**
  - **Meilleure qualité de vie du patient:**
    - **Moins visibles**
    - **Autorisent une activité physique**
  - **Confort et sécurité pour le patient**
  - **Réduction des risques de thrombose et d'infection**





*Kurul et al., Lancet Oncology, 2002*

# Infections sur CIP

Fréquentes ?

# CIP: voies veineuses les moins à risque d'infection

- Revue 200 études prospectives: /1000 J KT
  - KT periph 0.5
  - KT artériels 1.7
  - PICC 2.1
  - KT central courte durée 1.2-4.8
  - KT tunnellisé 1.6
  - Hémodialyse courte durée 4.8
  - Hémodialyse manchon/tunnel 1.6
  - Chambres implantables **0.1**

*Maki, Mayo Clin Proc, 2006*

# The late complications of totally implantable central venous access ports: The results from an Italian multicenter prospective observation study☆

European Journal of Oncology Nursing 15 (2011) 377–381

Alberto Dal Molin [a,*], Laura Rasero [b], Linda Guerretta [c], Elisa Perfetti [d], Mario Clerico [d]


Etude prospective, multicentrique

1076 patients suivis pendant plus de 18 mois:

- 515 patients avec utilisation régulière de la CIP, 32 695 jours
- 561 patients, utilisation très occasionnelle, 106 173 jours

# The late complications of totally implantable central venous access ports: The results from an Italian multicenter prospective observation study☆

European Journal of Oncology Nursing 15 (2011) 377–381

Alberto Dal Molin [a,*], Laura Rasero [b], Linda Guerretta [c], Elisa Perfetti [d], Mario Clerico [d]

Late complication in pt under treatment.

| Complication | N. | /1000 days of port observation | Port removal |
|---|---|---|---|
| Pocket infection | 3 | 0.09 (95% IC 0.065 to 0.115) | 1 case |
| Cutaneous site infection | 1 | 0.03 (95% IC 0.015 to 0.045) | |
| Occlusion | 8 | 0.24 (95% IC 0.203 to 0.277) | 1 case |
| Other complication | 12 | 0.37 (95% IC 0.328 to 0.412) | 2 cases (pocket haematoma and withdrawal occlusion associate to dislocation) |
| Total | 24 | 0.73 (95% IC 0.692 to 0.768) | |

# The late complications of totally implantable central venous access ports: The results from an Italian multicenter prospective observation study☆

European Journal of Oncology Nursing 15 (2011) 377–381

Alberto Dal Molin [a,*], Laura Rasero [b], Linda Guerretta [c], Elisa Perfetti [d], Mario Clerico [d]

Late complication in patients that went to the outpatient only to flushing the device.

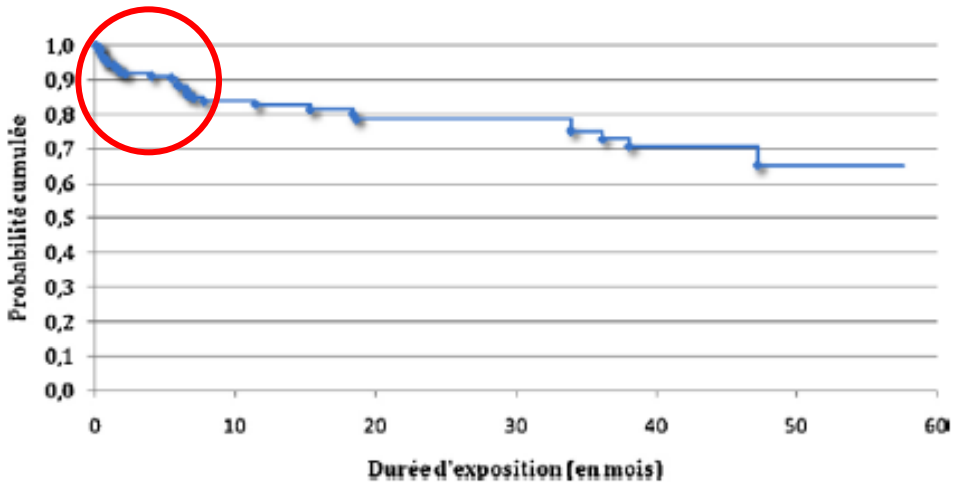
| Complication | N. | /1000 days of port observation |
|---|---|---|
| Device related bacteremia | 4[a] | 0.04 (95% IC 0.024 to 0.056) |
| Pocket infection | 1 | 0.01(95% IC 0.002 to 0.018) |
| Cutaneous site infection | 1 | 0.01(95% IC 0.002 to 0.018) |
| Occlusion | 3 | 0.03 (95% IC 0.016 to 0.044) |
| Other complication | 7 | 0.07 (95% IC 0.049 to 0.091) |
| Total | 16 | 0.15 (95% IC 0.120 to 0.179) |

Incidence, prévalence et facteurs de risque de survenue d'une première complication infectieuse sur chambres à cathéter implantables


- 209 patients inclus de façon prospective sur un an
- Monocentrique (Dijon)
- Indications carcinologiques (94%)

- Incidence: 0,37 infections/1000 jours de cathétérisme
- **16%** des patients

*Crisinel et al., MMI, 2009*




| Germes retrouvés | Nombre | Pourcentage (%) |
|---|---|---|
| *Staphylococcus aureus* Méti S | 9 | 26,5 |
| *S. aureus* Méti R | 6 | 17,6 |
| *S. epidermidis* | 5 | 14,7 |
| *Pseudomonas aeruginosa* | 4 | 11,8 |
| *Enterococcus fecalis* | 3 | 8,8 |
| *Escherichia coli* | 2 | 5,9 |
| *Klebsiella pneumoniae* | 2 | 5,9 |
| *Streptococcus oralis* | 1 | 2,9 |
| *Comamonas acidovorans* | 1 | 2,9 |
| *Stenotrophomonas maltophilia* | 1 | 2,9 |
| *Corynebacterium sp* | 1 | 2,9 |
| *Bacteroides fragilis* | 1 | 2,9 |
| *Candida glabrata* | 1 | 2,9 |

*Crisinel et al., MMI, 2009*

*Munck A et al. Eur Respir J 2004*

- *Candida sp. : 66%*
- *Staph. epidermidis : 22%*
- *Staph. aureus : 6%*
- *BG* négatif : *6%*

Etude rétrospective, 452 patients suivi pour mucoviscidose sous atb +/- nutrition parentérale

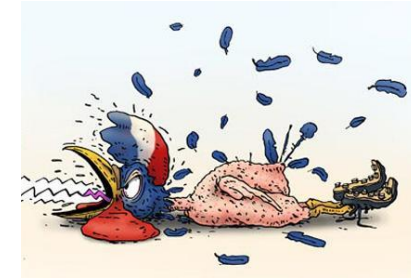
# Infections sur CIP

Facteurs de risque ?

Totally implantable central venous access port infections in patients with digestive cancer: Incidence and risk factors

American Journal of Infection Control 40 (2012) 935-9

Abdoulaye Touré PharmD, MSc[a,b,*], Philippe Vanhems MD, PhD[c,d], Catherine Lombard-Bohas MD[e], Philippe Cassier MD[e], Denis Péré-Vergé MD[f], Jean-Christophe Souquet MD, PhD[f], René Ecochard MD, PhD[g], Cécile Chambrier MD, PhD[a,b]



Etude prospective, multicentrique

315 patients, suivis 1 an

**41** patients vont présenter une bactériémie liée au KT (13%)

Survenue médiane 62 jours post-implantation

Incidence: 0,76 pour 1000 j de cathétérisme

# Totally implantable central venous access port infections in patients with digestive cancer: Incidence and risk factors

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Abdoulaye Touré PharmD, MSc[a,b,*], Philippe Vanhems MD, PhD[c,d], Catherine Lombard-Bohas MD[e], Philippe Cassier MD[e], Denis Péré-Vergé MD[f], Jean-Christophe Souquet MD, PhD[f], René Ecochard MD, PhD[g], Cécile Chambrier MD, PhD[a,b]

Risk factors associated with CVAP-BSI in patients with digestive cancer receiving IV chemotherapy at Lyon University Hospital in 2007-2011

| | Univariate | | Multivariate | |
|---|---|---|---|---|
| Factor | HR | 95% CI | HR | 95% CI |
| Age >55 years | 2.46* | 0.97-6.29 | 2.37 | 0.89-6.30 |
| Male sex | 1.00 | 0.54-1.87 | — | — |
| Location of primary cancer | | | | |
| Colorectum | 1.00 | Reference | 1.00 | Reference |
| Stomach | 1.54 | 0.45-5.26 | 0.79 | 0.22-2.79 |
| Liver | 1.53 | 0.31-7.38 | 1.39 | 0.28-6.84 |
| Biliary tract | 2.39 | 0.62-9.24 | 1.47 | 0.36-5.96 |
| Esophagus | 3.24* | 1.03-10.23 | 1.96 | 0.58-6.61 |
| Pancreas | 3.33* | 1.39-7.97 | 2.59* | 1.07-6.33 |
| Metastatic cancer | 0.75 | 0.40-1.39 | — | — |
| Cancer diagnosed at study period | 1.27 | 0.56-2.87 | — | — |
| Weight loss >10% | 2.35 | 1.23-4.48 | — | — |
| Diabetes mellitus | 1.28 | 0.61-2.67 | — | — |
| Presence of ostomy | 0.36* | 0.13-1.01 | — | — |
| WHO performance status | | | | |
| 0 | 1.00 | Reference | | Reference |
| 1 | 2.03 | 0.96-4.29 | 1.85 | 0.84-4.08 |
| 2-4 | 3.98† | 1.81-8.76 | 2.85* | 1.19-6.82 |
| Infections other than CVAP-BSI | 2.02* | 1.05-3.90 | — | — |
| Parenteral nutrition | 6.49* | 3.40-12.38 | 4.09† | 2.01-8.30 |
| Antithrombotic | 0.05 | 0.00-10.36 | — | — |

*$P \leq .05$.

†$P \leq .001$.

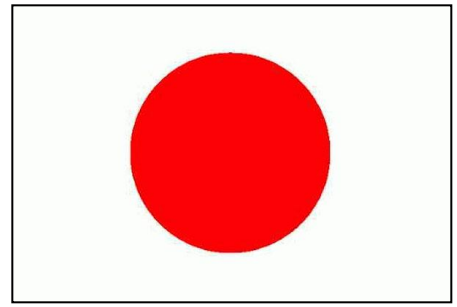
Incidence, prévalence et facteurs de risque de survenue d'une première complication infectieuse sur chambres à cathéter implantables


- Seul facteur de risque en analyse multivariée:

Hémopathie maligne

*Crisinel et al., MMI, 2009*

# Association between risk of bloodstream infection and duration of use of totally implantable access ports and central lines: A 24-month study



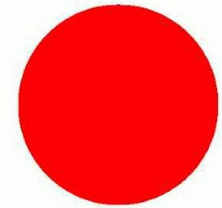
*(Am J Infect Control 2011;39:e39-43.)*

Junichi Yoshida, MD, MS, FACS,[a] Toshiyuki Ishimaru, MD,[b] Tetsuya Kikuchi, MT,[c] Nobuo Matsubara, MT,[c] and Ikuyo Asano, RN[d]
Shimonoseki, Japan

**Table 1.** Patient characteristics

| Characteristic | AP group | CL group | Total | *P* |
|---|---|---|---|---|
| Number of patients | 81 | 896 | 977 | |
| Age, years, median (range) | 70 (23-91) | 75 (0-98) | 75 (0-98) | .003* |
| Men/women, n | 42/39 | 522/374 | 566/413 | .291† |
| Days of use | | | | |
| Median (range) | 22 (1-148) | 13 (1-266) | 14 (1-266) | <.001* |
| Average (SD) | 42.7 (18.8) | 25.6 (21.8) | 26.6 (21.9) | |
| Total | 2,488 | 19,993 | 22,481 | |
| BSI, n/1,000 days of use, average (SD) | 7 (2.81) | 112 (5.60) | 119 (5.29) | |

# Association between risk of bloodstream infection and duration of use of totally implantable access ports and central lines: A 24-month study



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Shimonoseki, Japan

**Table 4.** Overall results of multivariate logistic regression analysis of the risk of BSI (n = 22,481 days of use)

| Variable | OR (95% CI) | P |
|---|---|---|
| Sex (male vs female) | 1.022 (0.701-1.489) | .911 |
| Diabetes mellitus (present vs absent) | 1.026 (0.494-2.130) | .945 |
| Renal disease (present vs absent) | 0.538 (0.131-2.216) | .390 |
| Preexisting sepsis (present vs absent) | 7.843 (4.666-13.184) | <.001* |
| Days of use (more vs fewer days of use) | 2.867 (1.823-4.507) | <.001* |
| Device (totally implantable AP vs CL) | 0.556 (0.256-1.208) | .138 |

*Statistically significant.

# Infections sur CIP

Est-ce grave ?

# Clinical Outcome After a Totally Implantable Venous Access Port-Related Infection in Cancer Patients

## *A Prospective Study and Review of the Literature*

*David Lebeaux, MD, Béatrice Larroque, MD, Justine Gellen-Dautremer, MD, Véronique Leflon-Guibout, MD, Chantal Dreyer, MD, Suzanne Bialek, MD, Antoine Froissart, MD, Olivia Hentic, MD, Catherine Tessier, MD, Raymond Ruimy, MD, PhD, Anne-Laure Pelletier, MD, Bruno Crestani, MD, PhD, Michel Fournier, MD, Thomas Papo, MD, Béatrix Barry, MD, PhD, Virginie Zarrouk, MD, and Bruno Fantin, MD, PhD*

(*Medicine* 2012;91: 309–318)

- **Enquête prospective monocentrique**
- **72 patients inclus**
- **18% sepsis sévère ou choc septique**
- **33 patients (46%) décédés à S12**
- **9 décès liés directement à l'infection de CIP**

# Clinical Outcome After a Totally Implantable Venous Access Port-Related Infection in Cancer Patients

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*David Lebeaux, MD, Béatrice Larroque, MD, Justine Gellen-Dautremer, MD, Véronique Leflon-Guibout, MD, Chantal Dreyer, MD, Suzanne Bialek, MD, Antoine Froissart, MD, Olivia Hentic, MD, Catherine Tessier, MD, Raymond Ruimy, MD, PhD, Anne-Laure Pelletier, MD, Bruno Crestani, MD, PhD, Michel Fournier, MD, Thomas Papo, MD, Béatrix Barry, MD, PhD, Virginie Zarrouk, MD, and Bruno Fantin, MD, PhD*

(*Medicine* 2012;91: 309–318)

**TABLE 3.** Factors Associated With Severe Sepsis or Septic Shock

| | Bivariable Analysis* | | | Multivariate Analysis† | | |
|---|---|---|---|---|---|---|
| **Characteristic** | **Severe Sepsis or Septic Shock (n = 13)** | **Nonsevere Infection (n = 59)** | **P** | **OR** | **95% CI** | **P** |
| CRP level, mg/L, median [range] | 127 [14–451] | 64 [2–262] | 0.014 | 1.008 | 1.001–1.016 | 0.02 |
| Yeast infection, n (%) | 3 (23) | 2 (3) | 0.038 | | | |

# Clinical Outcome After a Totally Implantable Venous Access Port-Related Infection in Cancer Patients

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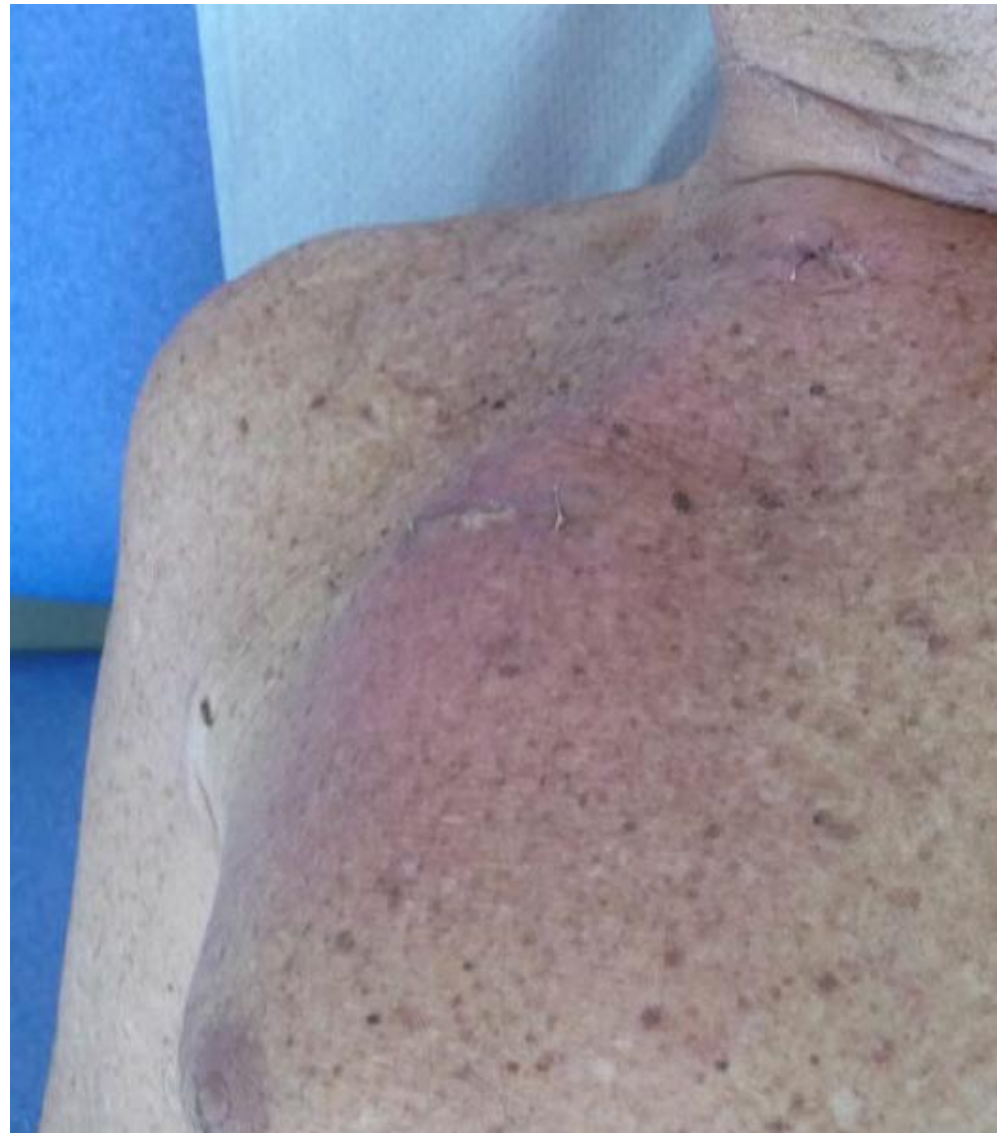
(*Medicine* 2012;91: 309–318)

TABLE 4. Factors Associated With Death Before Week 12

| Characteristic | Bivariable Analysis* | | | Multivariate Analysis† | | |
|---|---|---|---|---|---|---|
| | Death Before Week 12 (n = 33) | Alive at Week 12 (n = 39) | P | OR | 95% CI | P |
| Karnofsky score, median [range] | 50 [20–90] | 70 [30–100] | <0.0001 | 1.051 | 1.001–1.102 | 0.04 |
| Charlson comorbidity index, median [range] | 8 [3–14] | 7 [2–12] | 0.0039 | | | |
| Metastasis, n (%) | 29 (88) | 18 (46) | 0.0002 | 6.88 | 1.091–43.4 | 0.04 |
| Palliative care (cancelled antineoplastic chemotherapy), n (%) | 14 (42) | 2 (5) | 0.0001 | 10.6 | 1.53–73.3 | 0.016 |
| PMN cells/mm3, median [range] | 7555 [500–55,000] | 5250 [200–18,000] | 0.024 | | | |
| CRP level, mg/L, median [range] | 119 [16–451] | 54 [2–247] | 0.0015 | | | |

# Infections sur CIP

Diagnostic ?



# Diagnostic

- Signes locaux
- Signes généraux lors de la manipulation
- Bactériémies à point de départ CIP:
  - Hémocultures sur CIP positives plus rapidement qu'en périphérie
  - 2 heures
- Culture de l'extrémité distale du cathéter

# Infections sur CIP

Traitement ?

# Choix complexes

- Ablation
  - Immédiate
  - Différée
- Antibiothérapie probabiliste +/- verrou
- Eléments modifiant la décision
  - Microbiologie
  - Présentation clinique
  - Malade stable => besoin de ‘sauver’ le cathéter
    - Cathétérisme de longue durée (à vie !)
      - Unités de nutrition parentérale
    - Aplasique
      - Pas de blancs
      - Pas de plaquettes

# Ablation immédiate d'un CVC présumé infecté si

- **Signes locaux francs** (cellulite, tunnellite, collection purulente)
- Infection « **compliquée** » d'emblée : thrombophlébite, endocardite
- **Germes « à haut risque »** avec bactériémie
  - *Staphylococcus aureus*
  - *Pseudomonas sp.*
  - *Candida* sp.
  - Entérocoques ?
  - Entérobactéries multi-résistantes ?
- **Signes de gravité** (choc septique) sans autre cause apparente
- Bactériémie chez un malade porteur de **prothèse valvulaire**

*SRLF 2002*

# Recos IDSA ‘09

- **Ablation cathéter** si
  - BGN, *S. aureus*, enterocoque, fungi
  - Sepsis sévère, thrombophlébite, endocardite

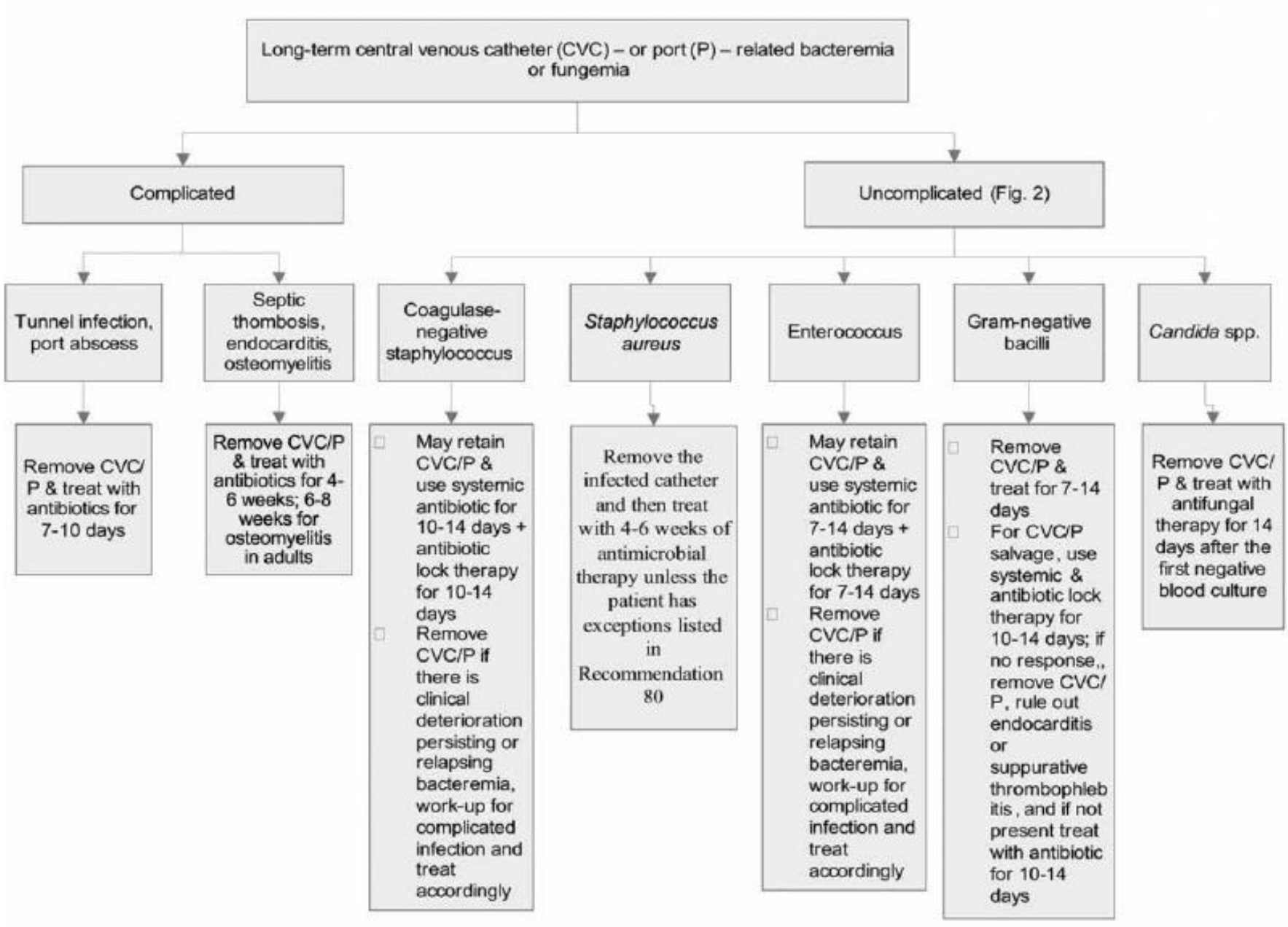
- Autres situations et cathéter indispensable, usage prolongé => **essai sauvetage** par verrou + ATB systémiques
  - Passer les ATB par le KT en cause
  - Ablation si hémocultures + à 72 h de traitement adapté

  - **4-6 sem de traitement si hémocultures + à H72** après ablation KT

*Mermel CID 2009*

# Recos IDSA ‘09

- Traitement probabiliste
  - Vancomycine si fréquence élevée SARM
  - Pas de linézolide
  - Couverture BGN selon écologie locale
  - Couverture levures si FDR
    - nutrition parentérale
    - colonisation préalable
    - neutropénique
- Large spectre pour couverture initiale
- Adaptation secondaire

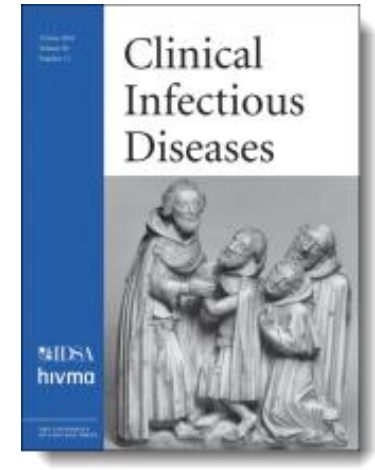


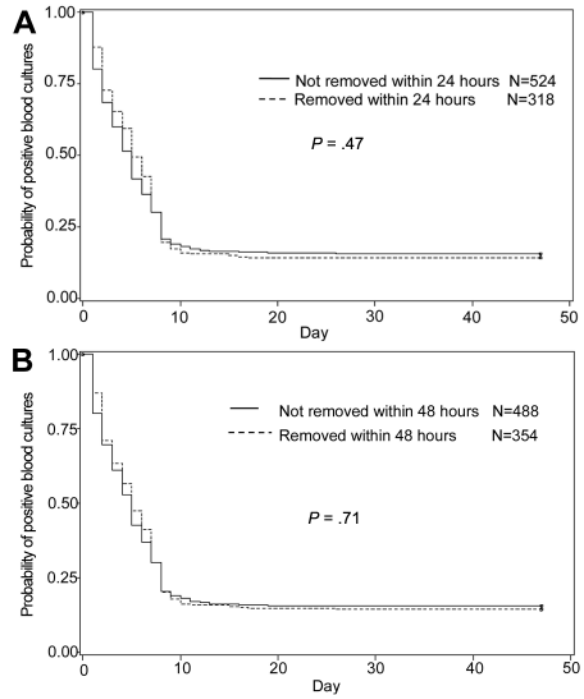

*Mermel et al. Clin Infect Dis 2009*

# Early Removal of Central Venous Catheter in Patients with Candidemia Does Not Improve Outcome: Analysis of 842 Patients from 2 Randomized Clinical Trials

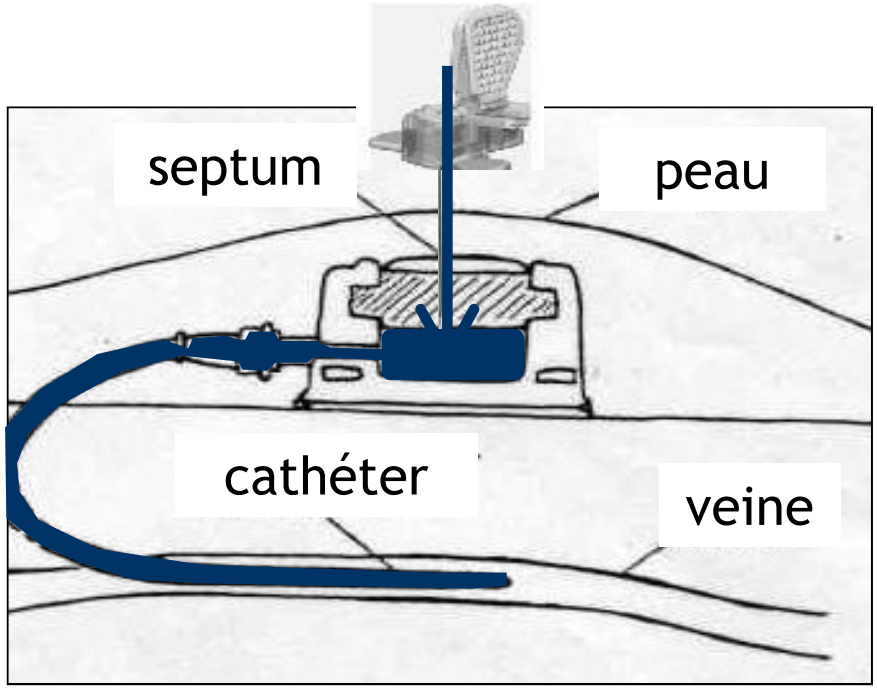
Clinical Infectious Diseases 2010; 51(3):295–303

Marcio Nucci,[1] Elias Anaissie,[2] Robert F. Betts,[3] Bertrand F. Dupont,[5] Chunzhang Wu,[4] Donald N. Buell,[4] Laura Kovanda,[4] and Olivier Lortholary[5,6]



# Verrous antibiotiques




Contact prolongé : 12-24h

Concentration élevée d'antibiotiques

→100-1000 x CMI

Objectif = lutte contre le biofilm

Fortun, J. F. *et al* 2006 J Antimicrob Chemother 58, 816
Rijnders, B. J. *et al* 2005 J Antimicrob Chemother 55, 90
Mermel, L.A. *et al* 2009 Clin Infect Dis 49, 1

# Verrous antibiotiques

- Efficacité bien documentée pour sauvetage KT infecté à staphylocoque coagulase neg

- Recette
  - Préparer une solution de sérum physiologique contenant
  - L'antibiotique choisi à la concentration de 0,2 à 10 mg/mL
  - 2500 à 5000 UI/mL d'Héparine non fractionnée
  - Injecter un volume suffisant pour remplir la lumière du KT (2-5 mL)
  - Ne pas utiliser le cathéter sur des durées prolongées (24 h 'optimal')

**Table 9. Final concentrations of antibiotic lock solutions used for the treatment of catheter-related bloodstream infection.**

| Antibiotic and dosage | Heparin or saline, IU/mL | Reference(s) |
|---|---|---|
| Vancomycin, 2.5 mg/mL | 2500 or 5000 | [100, 275] |
| Vancomycin, 2.0 mg/mL | 10 | [275] |
| Vancomycin, 5.0 mg/mL[a] | 0 or 5000 | [276, 277] |
| Ceftazidime, 0.5 mg/mL | 100 | [123] |
| Cefazolin, 5.0 mg/mL | 2500 or 5000 | [100, 277] |
| Ciprofloxacin, 0.2 mg/mL[b] | 5000 | [130] |
| Gentamicin, 1.0 mg/mL | 2500 | [100] |
| Ampicillin, 10.0 mg/mL | 10 or 5000 | [275] |
| Ethanol, 70%[c] | 0 | [131] |

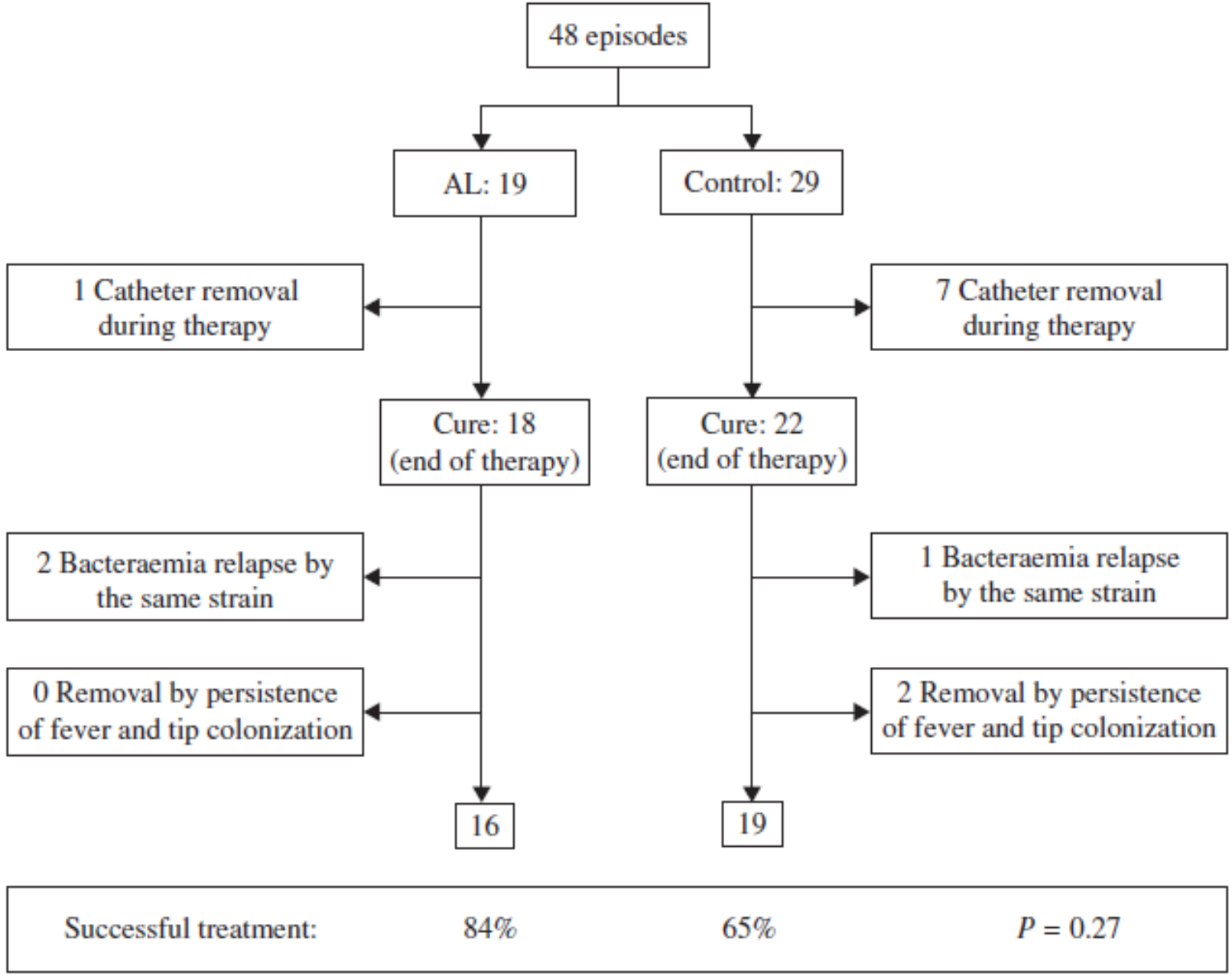
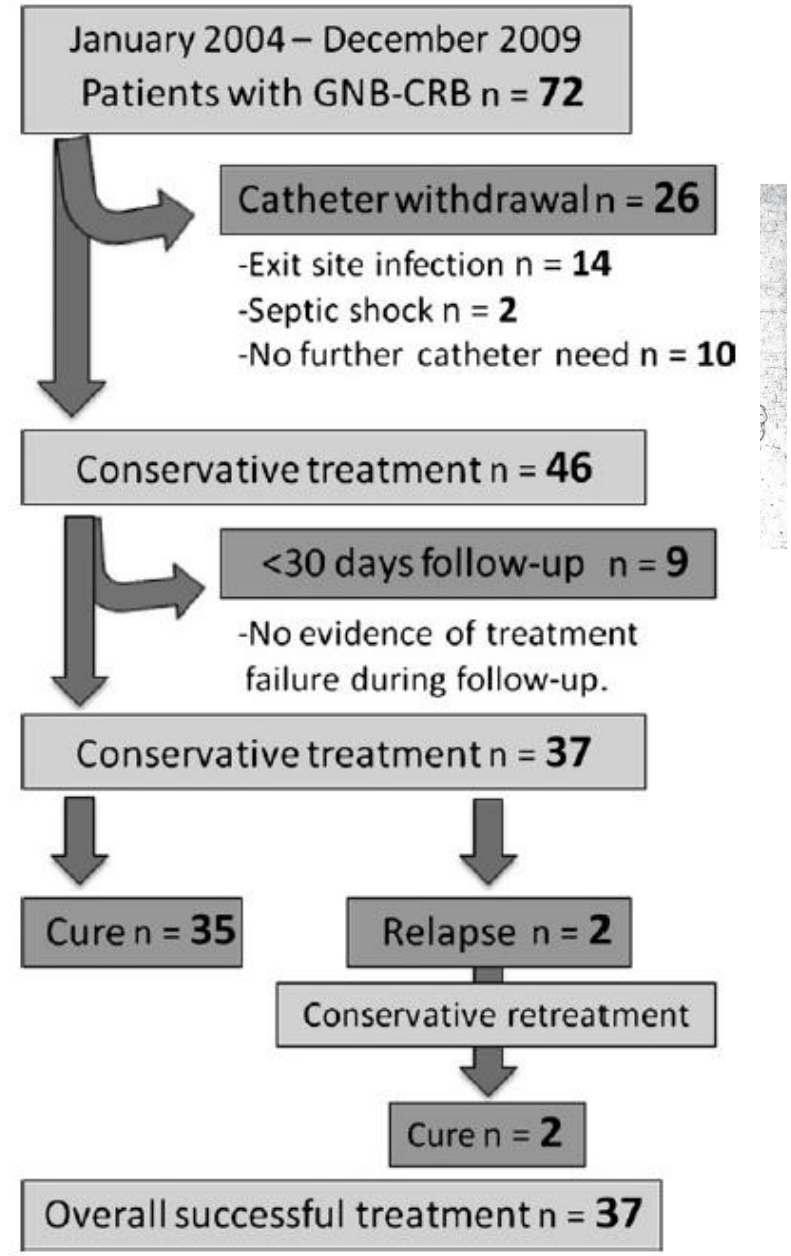

48 episodes
AL: 19
Control: 29
1 Catheter removal during therapy
7 Catheter removal during therapy
Cure: 18 (end of therapy)
Cure: 22 (end of therapy)
2 Bacteraemia relapse by the same strain
1 Bacteraemia relapse by the same strain
0 Removal by persistence of fever and tip colonization
2 Removal by persistence of fever and tip colonization
16
19
Successful treatment: 84% 65% P = 0.27

**Table 1. Clinical Characteristics of 46 Episodes of Gram-Negative Bacilli Long-Term Catheter-Related Bacteremia**

| Variable | |
|---|---|
| Age, years, median (range) | 62 (22–92) |
| Female, n (%) | 23 (50) |
| Type of catheter | |
| Tunneled, n (%) | 33 (72) |
| Totally implantable port, n (%) | 13 (28) |
| Use of catheter | |
| Hemodialysis, n (%) | 24 (52) |
| Chemotherapy, n (%) | 16 (35) |
| Others[a], n (%) | 6 (13) |
| Age-adjusted Charlson index [11], median (IQR) | 7 (5–9) |
| Absolute neutrophil count at diagnoses, 10e9/L, median (IQR) | 7900 (3850–11 500) |
| CRB etiologies | |
| Single GNB microorganism, n (%) | 36 (78) |
| *Pseudomonas* spp.[b], n | 11 |
| *Escherichia coli*, n | 6 |
| *Enterobacter cloacae*, n | 5 |
| *Klebsiella pneumoniae*, n | 4 |
| *Acinetobacter baumannii*, n | 3 |
| *Proteus* spp., n | 3 |
| Others[c], n | 4 |
| Polymicrobial GNB infection[d], n (%) | 10 (22) |



# Infections sur CIP: conclusions

- Moins fréquents que sur autres types de voies centrales
- Mais tout de même possible
- Potentielle gravité
- Traitement:
  - Des règles d'ablation
  - Mais des possibilités réelles de maintien: verrous

# Optimisme breton en ces temps de crise