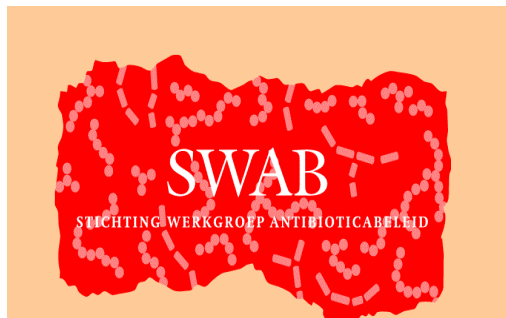


Guideline prostatitis

Suzanne Geerlings

Zagreb 30-3-2011



Background

- Optimal antibiotic use relevant for three key issues:
 - 1) clinical outcome
 - 2) bacterial resistance
 - 3) costs
- To guarantee appropriate antibiotic use, treatment guidelines are developed
- Adherence to guidelines reduce variation in care between different professionals and hospitals and improves clinical outcome



Prostatitis guideline: Which prostatitis?

- Acute bacterial prostatitis
- Chronic bacterial prostatitis
- Chronic non-bacterial prostatitis or chronic prostatitis/ chronic pelvic pain syndrome (CP/CPPS)

Diseases (NIDDK) classification, CP/CPPS is prostatitis category III (5) (Table 5). clinically relevant diagnostic or therapeutic results arising from differentiating infl non-inflammatory (NIH Cat. IIIB) CP/CPPS. CP/CPPS Cat. III is therefore consid to the more general definition described in Section 2.2 (see Table 2), the disease syndrome (PPS)' throughout the rest of this chapter.

Table 5: Classification of prostatitis according to NIDDK/NIH

- I. Acute bacterial prostatitis (ABP)
- II. Chronic bacterial prostatitis (CBP)
- III. Chronic pelvic pain syndrome (CPPS)
 - A. Inflammatory CPPS: WBC in semen/EPS/VB3
 - B. Non-inflammatory CPPS: no WBC semen/EPS/VB3
- IV. Asymptomatic inflammatory prostatitis (histological prostatitis)

WBC = white blood cells; EPS = expressed prostatic secretions; VB3 = voided

2.6.3 Pathogenesis

The aetiology and pathophysiology of PPS remains a mystery. Acute bacterial p

Guideline questions

- Acute and chronic bacterial prostatitis?
- CP/CPPS?
- Epididymitis and orchitis?
- Diagnosis?
- Prophylaxis?

Guideline questions

- Acute and chronic bacterial prostatitis?
- CP/CPPS?
- Epididymitis and orchitis?
- Diagnosis?
- Prophylaxis?

Guidelines on Urological Infections

M. Grabe (Chairman), T.E. Bjerklund-Johansen, H. Botto,
M. Çek, K.G. Naber, P. Tenke, F. Wagenlehner

premenopausal women

2.7 Acute uncomplicated UTIs in young men

2.7.1 Men with acute uncomplicated UTI

| | Reference | LE | GR |
|--|-----------|----|----|
| • only a small number of 15 to 50-year-old men suffer from acute uncomplicated UTI | 53 | | |
| • such men should receive, as minimum therapy, a 7-day antibiotic regimen | | 4 | B |

2.7.2 Men with UTI and concomitant prostate infection

| | Reference | LE | GR |
|--|-----------|----|----|
| • most men with febrile UTI have a concomitant infection of the prostate, as measured by transient increases in serum PSA and prostate volume | 54 | 2a | |
| • urological evaluation should be carried out routinely in adolescents and men with febrile UTI, pyelonephritis, recurrent infection, or whenever a complicating factor is suspected | | 4 | A |
| • a minimum treatment duration of 2 weeks is recommended, preferably with a fluoroquinolone since prostatic involvement is frequent. | 55 | 2a | B |

2.8 Asymptomatic bacteriuria

2.8.1 Diagnosis

| | Reference | LE | GR |
|---|-----------|----|----|
| • for women, a count of $\geq 10^5$ cfu/mL of a microorganism in a voided urine specimen is diagnostic of bacteriuria | 17 | 2b | B |

9. PROSTATITIS AND CHRONIC PELVIC PAIN SYNDROME

9.1 Summary and recommendations

Bacterial prostatitis is a disease entity diagnosed clinically and by evidence of inflammation and infection localized to the prostate. According to the duration of symptoms, bacterial prostatitis is described as either acute or chronic, when symptoms persist for at least 3 months. It is recommended that European urologists use the classification suggested by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health (NIH), in which bacterial prostatitis with confirmed or suspected infection is distinguished from chronic pelvic pain syndrome (CPPS).

Acute bacterial prostatitis can be a serious infection. Parenteral administration of high doses of a bactericidal antibiotic is usually required, which may include a broad-spectrum penicillin, a third-generation cephalosporin, or a fluoroquinolone. All of these agents can be combined with an aminoglycoside for initial therapy. Treatment is required until there is defeverescence and normalization of infection parameters (LE: 3, GR: B). In less severe cases, a fluoroquinolone may be given orally for 10 days (LE: 3, GR: B).

In chronic bacterial prostatitis, and if infection is strongly suspected in CPPS, a fluoroquinolone or trimethoprim should be given orally for 2 weeks after the initial diagnosis. The patient should then be reassessed and antibiotics only continued if pre-treatment cultures are positive and/or the patient has reported positive effects from the treatment. A total treatment period of 4-6 weeks is recommended (LE: 3, GR: B).

Patients with CPPS are treated empirically with numerous medical and physical modalities. Despite the existence of some scientifically valid studies, no specific recommendations have been made until now. This has been because patients with CPPS probably represent a heterogeneous group of diseases and therapeutic outcome is always uncertain.

9.2 Introduction and definition

Table 9.4: The most common pathogens in prostatitis.

Aetiologically recognized pathogens*

Escherichia coli

Klebsiella spp.

Proteus mirabilis

Enterococcus faecalis

Pseudomonas aeruginosa

Organisms of debatable significance

Staphylococci

Streptococci

Corynebacterium spp.

Chlamydia trachomatis

Ureaplasma urealyticum

Mycoplasma hominis

**Adapted from Weidner et al. (2) and Schneider et al. (14).*

9.4 Treatment

9.4.1 Antibiotics

Antibiotics are life-saving in acute bacterial prostatitis, recommended in chronic bacterial prostatitis and may be tried in inflammatory CPPS.

Acute bacterial prostatitis can be a serious infection with fever, intense local pain and general symptoms. Parenteral administration of high doses of bactericidal antibiotics, such as a broad-spectrum penicillin, a third-generation cephalosporin or a fluoroquinolone, may be administered. For initial therapy, these regimens may be combined with an aminoglycoside. After defeverescence and normalization of infection parameters, oral therapy can be substituted and continued for a total of about 2-4 weeks (32). In less severe cases, a fluoroquinolone may be given orally for 10 days (5) (IVC).

The recommended antibiotics in chronic bacterial prostatitis and inflammatory CPPS (NIH type IIIA), together with their advantages and disadvantages, are listed in Table 9.7 (33). Fluoroquinolones, such as ciprofloxacin and levofloxacin, are considered drugs of choice because of their favourable pharmacokinetic properties (33) (LE: 2b, GR: B), their generally good safety profile, and antibacterial activity against Gram-negative pathogens, including *Pseudomonas aeruginosa*. In addition, levofloxacin is active against Gram-positive and 'atypical' pathogens, such as *C. trachomatis* and genital mycoplasmas (LE: 2b, GR: B).

The duration of antibiotic treatment is based on experience and expert opinion and is supported by many clinical studies (34). In chronic bacterial prostatitis and in inflammatory CPPS, antibiotics should be given for 2 weeks after the initial diagnosis. The patient should then be reassessed and antibiotics continued only if cultures are positive or the patient reports positive effects from the treatment. A total treatment period of 4-6 weeks is recommended. Relatively high doses are needed and oral therapy is preferred (33,34) (LE: 3, GR: B).

The reason for administration of antibiotics in inflammatory CPPS is that there may be a bacterial infection, even though bacteria have not been detected by routine methods (35,36). Furthermore, many clinical studies report a beneficial effect of antibiotics in inflammatory CPPS (37,38) (LE: 2a, GR: B). If intracellular bacteria have been detected or are suspected, tetracyclines or erythromycin should be given (33,38) (LE: 2b, GR: B).

9.4.2 Antibiotics and α -blockers in combination therapy

Urodynamic studies have shown increased urethral closing pressure in patients with chronic prostatitis (5). A combination treatment of α -blockers and antibiotics is reported to have a higher cure rate than antibiotics alone in inflammatory CPPS (Type IIIA+B) (39) (LE: 1b, GR: B). This is a treatment option favoured by many urologists.

However, in a recent, randomized, double-blind placebo-controlled multicentre study, it was shown that neither ciprofloxacin, tamsulozin, nor the combination of both ciprofloxacin and tamsulozin were superior to placebo in reducing symptoms in men with moderate to severe symptoms (40) (LE: 1b, GR: B). However, in this latter study, many patients were included who had already been heavily pretreated with different drug regimens.

Table 9.7: Antibiotics in chronic bacterial prostatitis*

| Antibiotic | Advantages | Disadvantages | Recommendation |
|--------------|------------|---------------|----------------|
| 210 x 297 mm | | | |

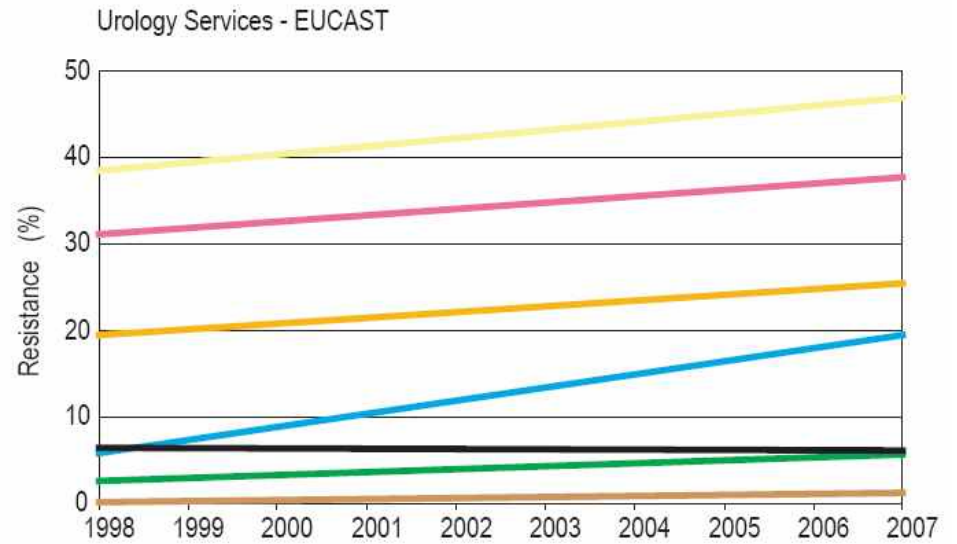
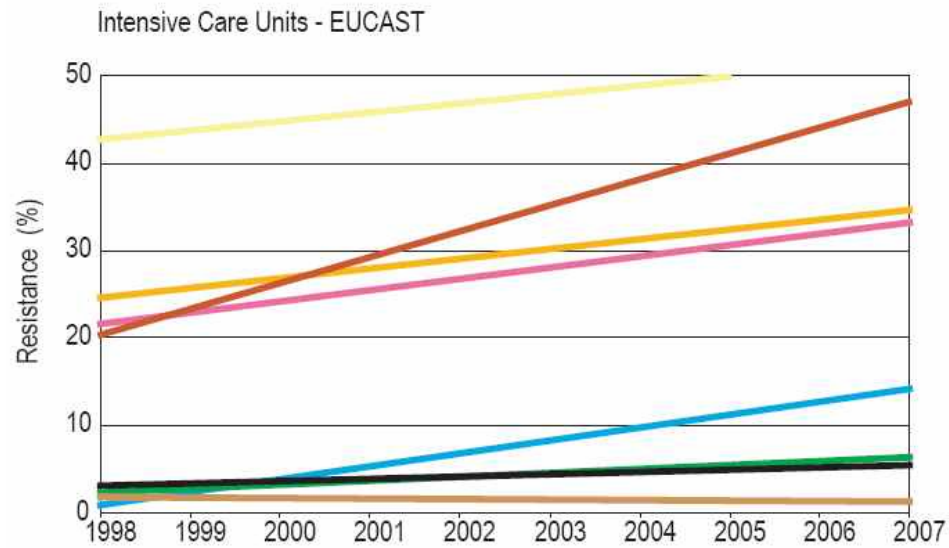
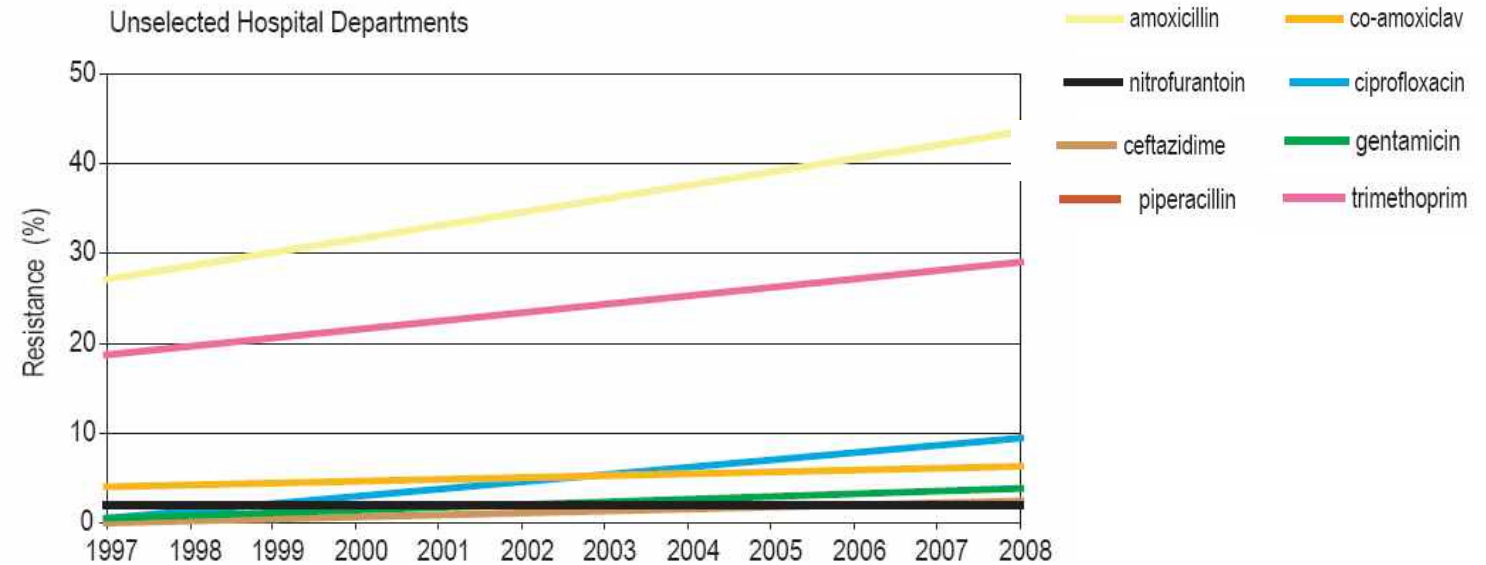
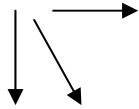
Guideline questions

- Acute and chronic bacterial prostatitis?
- CP/CPPS?
- Epididymitis and orchitis?
- Diagnosis?
- Prophylaxis?

Chronic prostatitis/ chronic pelvic pain syndrome (CP/CPPS)

- Prevalence between 8-9,7%
- Poorly understood disease with non-uniform diagnostic criteria
- 5-10% of cases proven bacterial aetiology
- PSA, imaging prostate, tests *Chlamydia trachomatis* and *Ureaplasma* not proven to provide benefit
- Clinical practice: many urologists treat patients with a **negative** urine culture:
ciprofloxacin 6 weeks

Escherichia coli

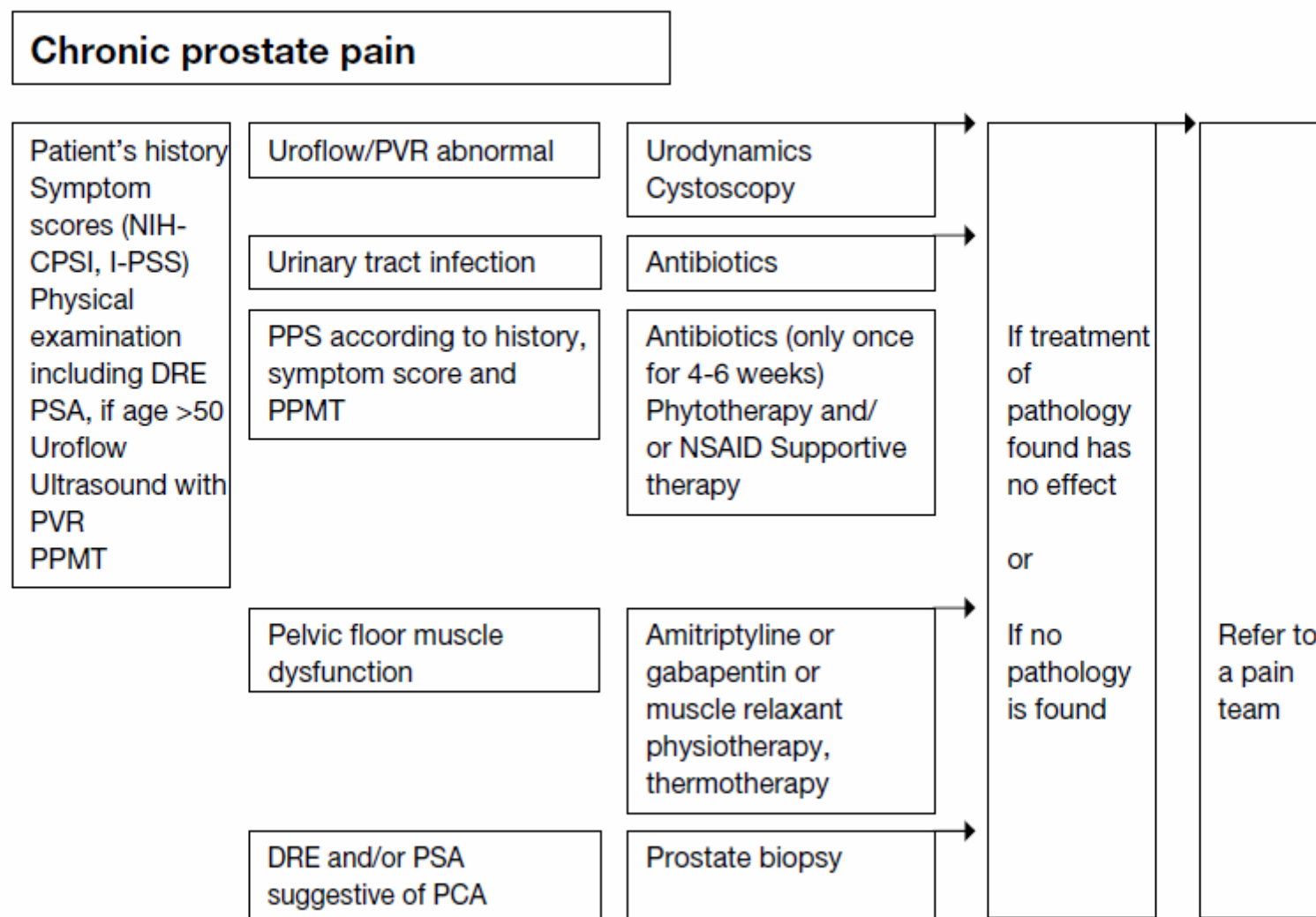


Guidelines on Chronic Pelvic Pain

M. Fall (chairman), A.P. Baranowski, S. Elneil, D. Engeler,
J. Hughes, E.J. Messelink, F. Oberpenning, A.C. de C. Williams

2.6 Prostate pain syndrome (PPS)

Figure 2: General diagnostic and treatment algorithm for chronic prostate pain



NIH-CPSI = National Institute of Health chronic prostatitis symptom index; I-PSS = international prostate

PPS during the last years. The effects of alpha-antagonists may include improved outflow performance by blocking the alpha-receptors of the bladder neck and prostate and by direct action on alpha1A/1D-receptors in the CNS (36). In contrast, a metaanalysis of nine trials ($n = 734$) could not show a beneficial effect on pain (37). Moreover, a recent adequately powered large placebo-controlled randomized trial of 12-week treatment with alfuzosin failed to show any significant difference in the outcome measures with the exception of the Male Sexual Health Questionnaire scores (38). Overall, the use of alpha-blockers for the treatment of PPS can no more be recommended and it should probably be restricted to patients with proven bladder outlet obstruction.

2.6.5.2 Antibiotic therapy. Empirical antibiotic therapy is widely used because some patients have improved with antimicrobial therapy. Patients responding to antibiotics should be maintained on medication for 4-6 weeks or even longer. Unfortunately, culture, leucocyte and antibody status of prostate-specific specimens do not predict antibiotic response in patients with PPS (39), and prostate biopsy culture findings do not differ from those of healthy controls (40). Long-term results with trimethoprim-sulphamethoxazole have remained poor (41-43). More encouraging results have been obtained with quinolones, including ciprofloxacin (44) and ofloxacin (39,45), but overall, antibiotic treatment of the PPS is based only on weak evidence. After one unsuccessful course of a quinolone antibiotic over 4-6 weeks, other therapeutic options should be offered.

2.6.5.3 Non-steroidal anti-inflammatory drugs. Non-steroidal anti-inflammatory drugs may have favourable results in some patients. Immunomodulation using cytokine inhibitors or other approaches may be helpful, but proper trials are needed before this type of therapy can be recommended (46,47). Only one RCT has been published. This was for rofecoxib, which is no longer on the market; statistical significance was achieved in some of the outcome measures (48).

2.6.5.4 Corticosteroids are not recommended. A few anecdotal case reports have shown some improvement. However, no significant benefits were shown in a low-power, placebo-controlled, randomized pilot study of a

Guideline questions

- Acute and chronic bacterial prostatitis?
- CP/CPPS?
- Epididymitis and orchitis?
- Diagnosis?
- Prophylaxis?

Guidelines on Urological Infections

M. Grabe (Chairman), T.E. Bjerklund-Johansen, H. Botto,
M. Çek, K.G. Naber, P. Tenke, F. Wagenlehner

10. EPIDIDYMITIS AND ORCHITIS

10.1 Definition and classification

Epididymitis, inflammation of the epididymis, causes pain and swelling which is almost always unilateral and relatively acute in onset. In some cases, the testis is involved in the inflammatory process (epididymo-orchitis). On the other hand, inflammatory processes of the testicle, especially virally induced orchitis, often involve the epididymis.

Orchitis and epididymitis are classified as acute or chronic processes according to the onset and clinical course. Chronic disease with induration develops in 15% of acute epididymitis cases. In the case of testicular involvement, chronic inflammation may result in testicular atrophy and the destruction of spermatogenesis (1,2).

Guideline questions

- Acute and chronic bacterial prostatitis?
- CP/CPPS?
- Epididymitis and orchitis?
- **Diagnosis?**
- Prophylaxis?

Guidelines on Urological Infections

M. Grabe (Chairman), T.E. Bjerklund-Johansen, H. Botto,
M. Çek, K.G. Naber, P. Tenke, F. Wagenlehner



4- or 2 glass test

- 4 glass test Meares and Stamey (1968):
- To differentiate bacteria from urethra, bladder or prostate:
 1. first voided,
 2. midstream urine
 3. prostatic secretion
 4. urine after prostatic massage
- 2 glass test: 1.midstream urine, 2.urine after prostatatic massage

6: Algorithm for diagnostic urological work-up in prostatitis.

Clinical evaluation

Urinalysis and urine culture

Exclude sexually transmitted diseases

Micturition chart, uroflowmetry and residual urine

Four-glass test according to Meares and Stamey

Microscopy

Culture

Try antibiotics if signs of inflammation

Additional investigations

A working group believes that guidelines on prostatitis should not

Adapted from Weidner et al. (2) and Schneider et al. (14).

There is no correlation between leucocyte and bacterial counts and the severity of symptoms in men with chronic prostatitis/CPPS (17). It has also been shown that culture, leucocyte and antibody status does not predict antibiotic response in this group of prostatitis (18). In both studies, however, patients with clearly defined chronic bacterial prostatitis were excluded.

9.3.4 *Perineal biopsy*

Perineal biopsies may be taken to help in the detection of difficult-to-culture micro-organisms, but perineal biopsy should be reserved for research purposes and cannot be recommended as part of the routine work-up. Bacteria have been cultured from perineal prostate biopsies in 36% of men with CPPS, but these results do not differ from the findings in asymptomatic controls (19).

9.3.5 *Other tests*

The main parameter for diagnosis of inflammation in the male urogenital tract is increased leucocyte counts in the prostatic fluid, post-prostate massage urine, and seminal fluid.

Prostatic biopsy is not indicated in the routine management of prostatitis/CPPS. However, histological prostatitis is frequently diagnosed in biopsies taken for suspected prostate cancer. If such patients are asymptomatic, they are classified in the new category of 'asymptomatic prostatitis' (type IV) (Table 9.3).

Other inflammatory markers include elevated pH, lactate dehydrogenase (LDH) and immunoglobulins (20). The cytokines, interleukin (IL)-1 β and tumour necrosis factor (TNF)- α , may be identified in EPS (20) and complement C3, coaguloplasmin or polymorphonuclear (PMN) elastase in the ejaculate. These tests, however, cannot be considered to be part of routine diagnostic work-up (21).

Transrectal ultrasound (TRUS) may reveal intraprostatic abscesses, calcification in the prostate and dilatation in the seminal vesicles. However, TRUS is not an important classification parameter in prostatitis (22), as it is unreliable in the diagnosis of prostatitis.

Guideline questions

- Acute and chronic bacterial prostatitis?
- CP/CPPS?
- Epididymitis and orchitis?
- Diagnosis?
- Prophylaxis?

Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults

Lindsay E. Nicolle,¹ Suzanne Bradley,² Richard Colgan,³ James C. Rice,⁴ Anthony Schaeffer,⁵ and Thomas M. Hooton⁶

¹University of Manitoba, Winnipeg, Canada; ²University of Michigan, Ann Arbor; ³University of Maryland, Baltimore; ⁴University of Texas, Galveston; ⁵Northwestern University, Chicago, Illinois; and ⁶University of Washington, Seattle

SUMMARY OF RECOMMENDATIONS

1. The diagnosis of asymptomatic bacteriuria should be based on results of culture of a urine specimen collected in a manner that minimizes contamination (A-II) (table 1).

- For asymptomatic women, bacteriuria is defined as 2 consecutive voided urine specimens with isolation of the same bacterial strain in quantitative counts $\geq 10^5$ cfu/mL (B-II).
- A single, clean-catch voided urine specimen with 1 bacterial species isolated in a quantitative count $\geq 10^5$ cfu/mL identifies bacteriuria in men (B-III).

3–7 days (A-II).

- Periodic screening for recurrent bacteriuria should be undertaken following therapy (A-III).
 - No recommendation can be made for or against repeated screening of culture-negative women in later pregnancy.
4. Screening for and treatment of asymptomatic bacteriuria before transurethral resection of the prostate is recommended (A-I).
- An assessment for the presence of bacteriuria should be obtained, so that results will be available to direct antimicrobial therapy prior to the procedure (A-III).

Catheters

tely 80% of acute care fa-
0 days) indwelling urethral
py, usually for an indication
[1]. This high frequency of
es assessment of outcomes
tic bacteriuria problematic.
catheter-acquired infections
m were asymptomatic, re-
am infection [92]. A case-
tion of bacteriuria with in-
creased mortality 3-fold, but
n was not clear, and multi-
icrobial therapy did not alter
A prospective, randomized,
ent of funguria in 313 pa-
m had indwelling urethral
ences in eradication of fun-

Antimicrobial treatment of asymptomatic women with cath-
eter-acquired bacteriuria that persists 48 h after catheter
removal may be considered. (B-I)

Urologic Interventions

Patients with asymptomatic bacteriuria who undergo traumatic
genitourinary procedures associated with mucosal bleeding have
a high rate of postprocedure bacteremia and sepsis. Bacteremia
occurs in up to 60% of bacteriuric patients who undergo tran-
surethral prostatic resection, and there is clinical evidence of
sepsis in 6%–10% of these persons [98]. Retrospective analysis
[99] and prospective, randomized clinical trials [100–103] sup-
port the effectiveness of antimicrobial treatment in preventing
these complications in bacteriuric men undergoing transurethral
resection of the prostate. In one comparative trial, the efficacy
of cefotaxime was superior to that of methenamine mandelate
[101]. There is little information relevant to other procedures,
but any intervention with a high probability of mucosal bleeding

Guidelines on Urological Infections

M. Grabe (Chairman), T.E. Bjerklund-Johansen, H. Botto,
M. Çek, K.G. Naber, P. Tenke, F. Wagenlehner

11. PERIOPERATIVE ANTIBACTERIAL PROPHYLAXIS IN UROLOGY

11.1 Summary

The aim of antimicrobial prophylaxis in urological surgery is to prevent infective complications that result from diagnostic and therapeutic procedures. However, the evidence on the best choice of antibiotics and prophylactic regimens is limited (Table 11.1).

Before surgery, it is essential to categorise the patients in relation to (1):

- general health status according to American Society of Anesthesiology (ASA) score P1–P5
- presence of general risk factors such as older age, diabetes mellitus, impaired immune system, malnutrition, extreme weight
- presence of specific endogenous or exogenous risk factors such as a history of UTI or urogenital infection, indwelling catheters, bacterial burden, previous instrumentation, genetic factors
- type of surgery and surgical field contamination burden
- expected level of surgical invasiveness, duration and technical aspects

Only transrectal core prostate biopsy (LE: 1b, GR: A) and TURP (LE: 1a, GR: A) are well documented. There is no evidence for any benefits of antibiotic prophylaxis in standard non-complicated endoscopic procedures

The use of antimicrobials should be based on knowledge of the local pathogen profile and antibiotic susceptibility pattern. Best practice includes surveillance and an audit of infectious complications.

Table 11.1. Level of evidence and grade of recommendation for standard urological procedures.

(The consequences in terms of antibiotic prophylaxis are given in Table 11.5)

| Procedure | LE | GR | Remarks |
|--|-------|----|--|
| <i>Diagnostic procedures</i> | | | |
| Cystoscopy | 1b | A | Low frequency of infections Contradictory findings |
| Urodynamic study | 1a | A | Low frequency of infections Contradictory findings |
| Transrectal core biopsy of prostate | 1b | A | High risk of infection Assess carefully risk factors |
| Diagnostic ureteroscopy | 4 | C | No available studies |
| <i>Therapeutic procedures</i> | | | |
| TURB | 2b | C | Poor data. No concern given to burden of tumor, necrosis |
| TURP | 1a | A | Good documentation |
| ESWL | 1a/1b | A | Low frequency of infections Contradictory findings |
| Ureteroscopy stone | 2b | B | Literature does not distinguish between severity of stone management |
| Percutaneous stone management | 2b | B | High risk of infection |
| <i>Open and laparoscopic surgery</i> | | | |
| <i>Clean operations (no opening of urinary tract)</i> | | | |
| Nephrectomy | 3 | C | SSI poorly documented Catheter-related UTI |
| Scrotal surgery | 3 | C | Review studies contradictory |
| Prosthetic implants | 3 | B | Limited documentation Regimen not defined |
| <i>Clean-contaminated (opening of urinary tract)</i> | | | |
| Nephroureterectomy | 3 | B | Poor documentation |
| Pelvio-ureteric junction repair | 4 | C | No studies detected |
| Total (radical) prostatectomy | 2a | B | No RCT, poor documentation |
| Partial bladder resection | 3 | C | No specific RCT studies |
| <i>Clean-contaminated/contaminated (opening of bowel, urine deviation)</i> | | | |
| Cystectomy with urine deviation | 2a | B | Limited documentation |

ESWL = extracorporeal shockwave lithotripsy; TURB = transurethral resection of the bladder; TURP = transurethral resection of the prostate; RCT = Randomised Controlled Trials

Table 11.5: Recommendations for antibiotic prophylaxis in standard urological surgery.

| Procedure | Pathogens (expected) | Prophylaxis | Antibiotics | Remarks |
|--|--|--------------|---|---|
| Diagnostic procedures | | | | |
| Transrectal biopsy of the prostate | Enterobacteriaceae Anaerobes? | All patients | Fluoroquinolones TMP ± SMX Metronidazole? ¹ | Single dose effective in low-risk patients. Consider prolonged course in high-risk patients |
| Cystoscopy Urodynamic examination | Enterobacteriaceae Enterococci Staphylococci | No | TMP ± SMX Cephalosporin 2 nd Generation | Consider in high-risk patients |
| Ureteroscopy | Enterobacteriaceae Enterococci Staphylococci | No | TMP ± SMX Cephalosporin 2 nd generation | |
| Endourological surgery and ESWL | | | | |
| ESWL | Enterobacteriaceae Enterococci | No | TMP ± SMX Cephalosporin 2 nd or 3 rd generation Aminopenicillin/BLIa | In patients with stent or nephrostomy tube or other risk factor |
| Ureteroscopy for uncomplicated distal stone | Enterobacteriaceae Enterococci Staphylococci | No | TMP ± SMX Cephalosporin 2 nd or 3 rd generation Aminopenicillin/BLI Fluoroquinolones | Consider in risk patients |
| Ureteroscopy of proximal or impacted stone and percutaneous stone extraction | Enterobacteriaceae Enterococci Staphylococci | All patients | TMP ± SMX Cephalosporin 2 nd or 3 rd generation Aminopenicillin/BLI Fluoroquinolones | Short course Length to be determined Intravenous suggested at operation |
| TUR of the prostate | Enterobacteriaceae Enterococci | All patients | TMP ± SMX Cephalosporin 2 nd or 3 rd generation Aminopenicillin/BLI | Low-risk patients and small-size prostate require no prophylaxis |
| TUR of bladder tumour | Enterobacteriaceae Enterococci | No | TMP ± SMX Cephalosporin 2 nd or 3 rd generation Aminopenicillin/BLI | Consider in high-risk patients and large tumours |

| Aminopenicillin/BLI | | | | |
|---|--|--------------|--|---|
| <i>Open or laparoscopic urological surgery</i> | | | | |
| Clean operations | Skin-related pathogens, e.g. staphylococci Catheter-associated uropathogens | No | | Consider in high-risk patients Short postoperative catheter requires no treatment |
| Clean-contaminated (opening of urinary tract) | Enterobacteriaceae Enterococci Staphylococci | Recommended | TMP ± SMX Cephalosporin 2 nd or 3 rd generation Aminopenicillin/BLI | Single peri-operative course |
| Clean-contaminated/ contaminated (use of bowel segments) | Enterobacteriaceae Enterococci Anaerobes Skin-related bacteria | All patients | Cephalosporin 2 nd or 3 rd generation Metronidazole | As for colonic surgery |
| Implant of prosthetic devices | Skin-related bacteria, e.g. staphylococci | All patients | Cephalosporin 2 nd or 3 rd generation Penicillin (penicillinase stable) | |

¹No evidence for metronidazole in core biopsy of the prostate

BLI = beta-lactamase inhibitor; ESWL = extracorporeal shockwave lithotripsy; TMP ± SMX = trimethoprim with or without sulphamethoxazole (co-trimoxazole); TUR = transurethral resection.

Other guidelines about UTI

- Not used:

International Clinical Practice Guidelines for the Treatment of Acute Uncomplicated Cystitis and Pyelonephritis in Women: A 2010 Update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases

Kalpana Gupta,¹ Thomas M. Hooton,² Kurt G. Naber,⁹ Björn Wullt,¹⁰ Richard Colgan,³ Loren G. Miller,⁴ Gregory J. Moran,⁵ Lindsay E. Nicolle,⁸ Raul Raz,¹¹ Anthony J. Schaeffer,⁶ and David E. Soper⁷

¹Department of Medicine, Veterans Affairs Boston Health Care System and Boston University School of Medicine, Boston, Massachusetts; ²Department of Medicine, University of Miami Miller School of Medicine, University of Miami, Miami Florida; ³Department of Family and Community Medicine, University of Maryland, Baltimore, Maryland; ⁴Division of Infectious Diseases, Harbor-UCLA Medical Center, Torrance, and ⁵Department of Emergency Medicine and Division of Infectious Diseases Olive View-UCLA Medical Center, Sylmar, California; ⁶Department of urology, Northwestern University, Chicago, Illinois; and ⁷Departments of Obstetrics and Gynecology and Medicine, Medical University of South Carolina, Charleston, South Carolina; ⁸Department of Internal Medicine and Department of Medical Microbiology University of Manitoba, Winnipeg, Canada; ⁹Technical University of Munich, Munich, Germany; ¹⁰Lund University Hospital, Lund, Sweden; and ¹¹Infectious Diseases Unit, Ha'Emek Medical Center, Afula, and Rappaport Faculty of Medicine, Technion, Haifa, Israel

A Panel of International Experts was convened by the Infectious Diseases Society of America (IDSA) in collaboration with the European Society for Microbiology and Infectious Diseases (ESCMID) to update the

Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America

Thomas M. Hooton,¹ Suzanne F. Bradley,³ Diana D. Cardenas,² Richard Colgan,⁴ Suzanne E. Geerlings,⁷ James C. Rice,^{5a} Sanjay Saint,³ Anthony J. Schaeffer,⁶ Paul A. Tambayh,⁸ Peter Tenke,⁹ and Lindsay E. Nicolle^{10,11}

Departments of ¹Medicine and ²Rehabilitation Medicine, University of Miami, Miami, Florida; ³Department of Internal Medicine, Ann Arbor Veterans Affairs Medical Center and the University of Michigan, Ann Arbor, Michigan; ⁴Department of Family and Community Medicine, University of Maryland, Baltimore; ⁵Department of Medicine, University of Texas, Galveston; ⁶Department of Urology, Northwestern University, Chicago, Illinois; ⁷Department of Infectious Diseases, Tropical Medicine, and AIDS, University of Amsterdam, Amsterdam, The Netherlands; ⁸Department of Medicine, National University of Singapore, Singapore; ⁹Department of Urology, Jahn Ferenc Del-Pesti Korhaz, Budapest, Hungary; and Departments of ¹⁰Internal Medicine and ¹¹Medical Microbiology, University of Manitoba, Winnipeg, Canada

Guidelines for the diagnosis, prevention, and management of persons with catheter-associated urinary tract infection (CA-UTI), both symptomatic and asymptomatic, were prepared by an Expert Panel of the Infectious Diseases Society of America. The evidence-based guidelines encompass diagnostic criteria, strategies to reduce the risk of CA-UTIs, strategies that have not been found to reduce the incidence of urinary infections, and management strategies for patients with catheter-associated asymptomatic bacteriuria or symptomatic urinary