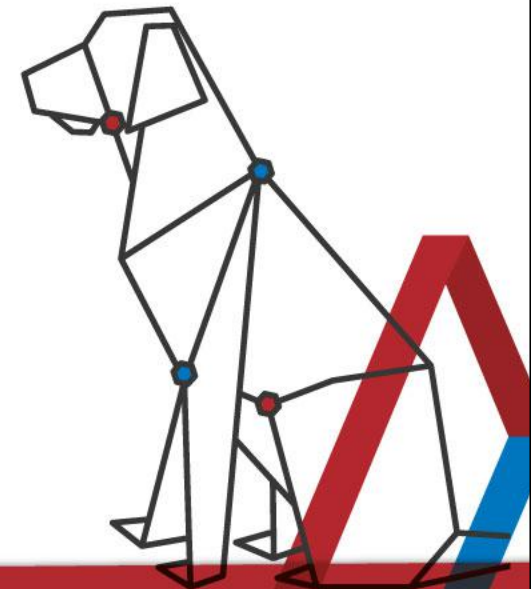
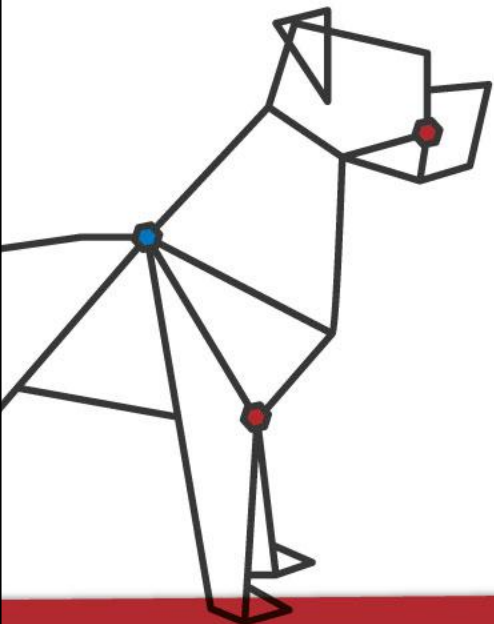




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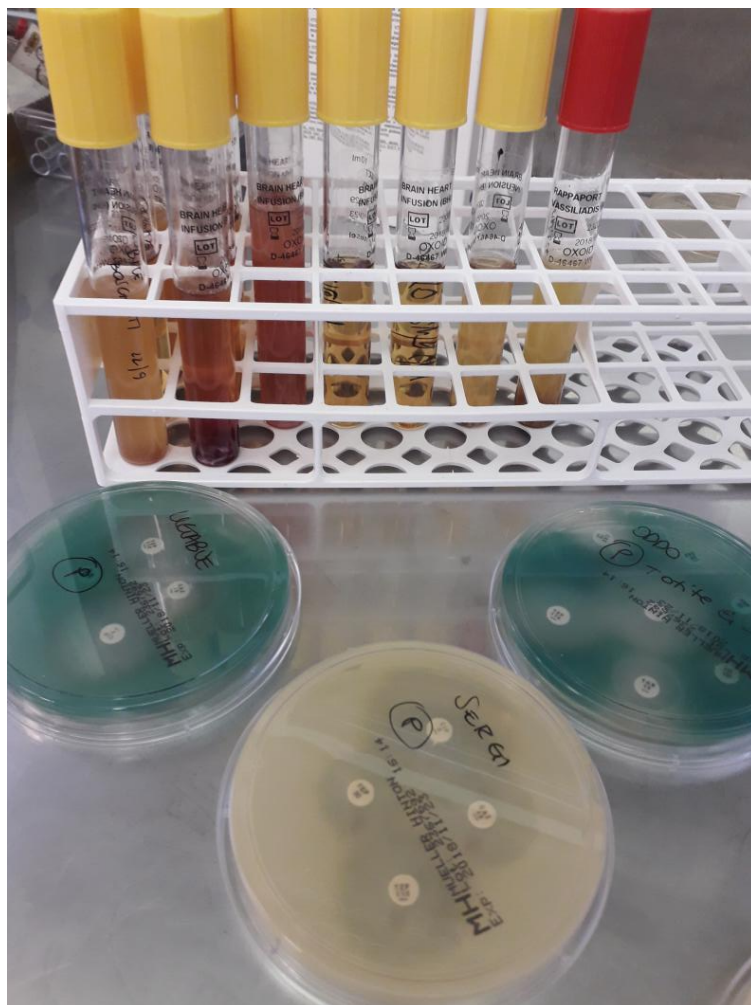
L'IMPORTANZA DELL'ESAME BATTERIOLOGICO NELLA PRATICA CLINICA

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Quando e perchè ricorrere all'esame batteriologico?

1. SOSPETTO INFEZIONE BATTERICA
2. NECESSITÀ TERAPIA ANTIBIOTICA
3. ADEGUAMENTO TERAPIA EMPIRICA GIÀ IN ATTO
4. MONITORAGGIO RECIDIVE
5. MONITORAGGIO AMBIENTALE
6. PROFILASSI/STERILITÀ (RIPRODUZIONE, CHIRURGIA)
7. IDENTIFICAZIONE PORTATORI SANI
8. DIAGNOSI POST-MORTEM



La microbiologia diagnostica è una
scienza INTERPRETATIVA



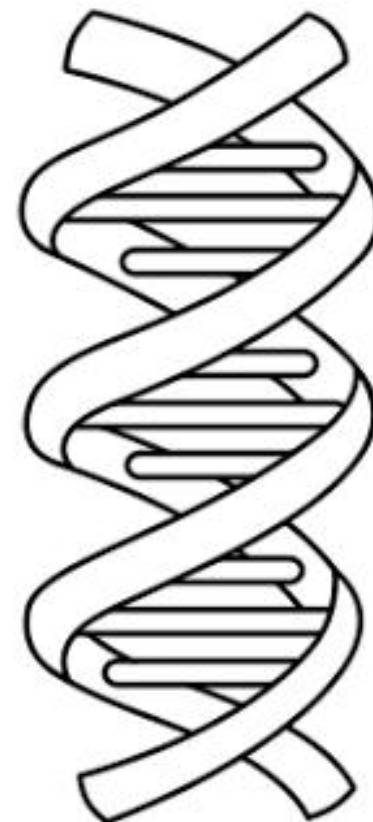
informazioni + qualità dei
campioni



risultato più attendibile

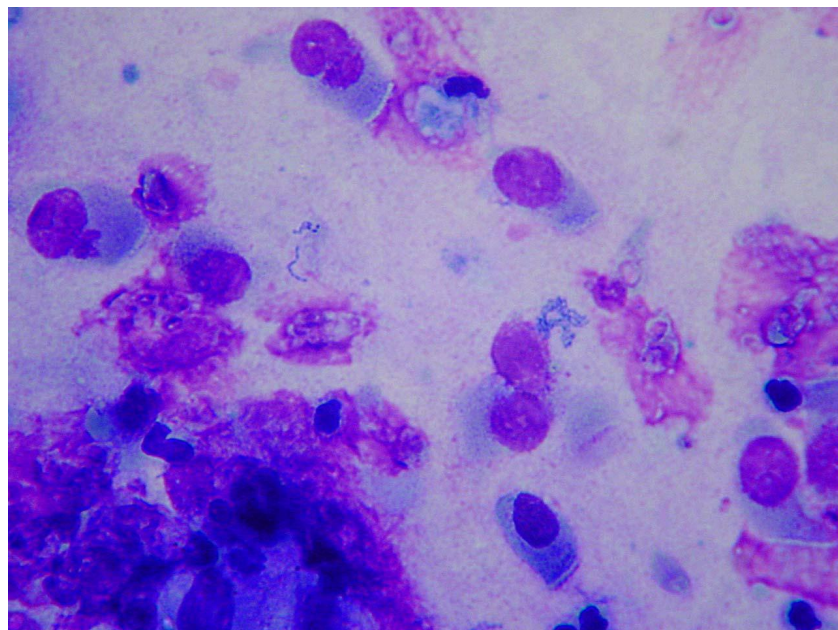
DISCIPLINE COMPLEMENTARI ALLA BATTERIOLOGIA

- ITER DIAGNOSTICO
- BIOLOGIA MOLECOLARE
- SIEROLOGIA
- CITOLOGIA (IMPRESINDIBILE IN ALCUNI CASI)



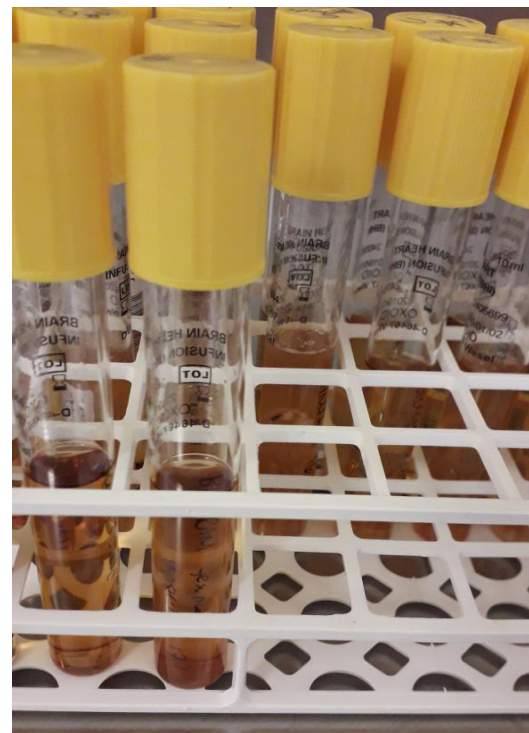
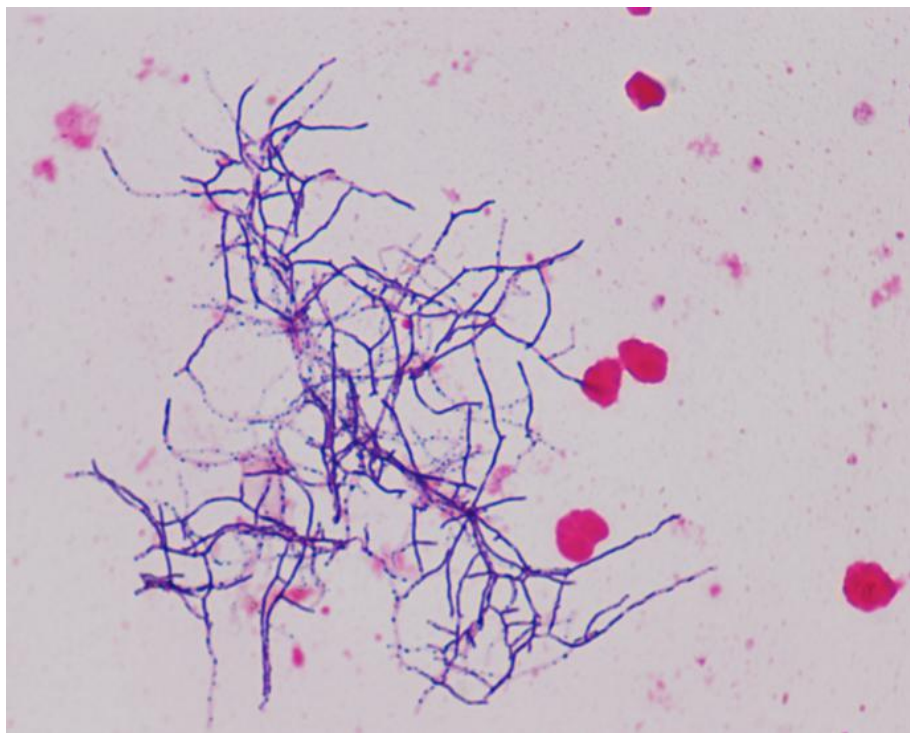
DISCIPLINE COMPLEMENTARI ALLA BATTERIOLOGIA

LAVAGGIO BRONCOALVEOLARE



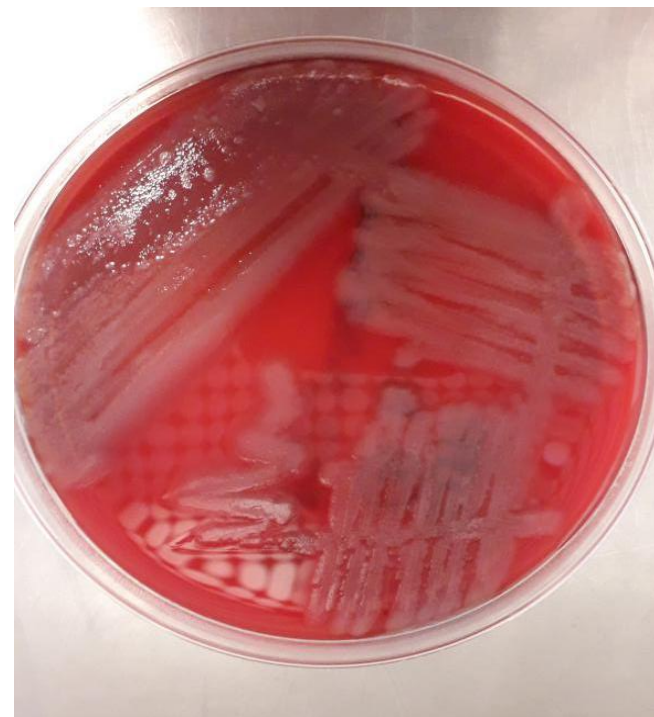
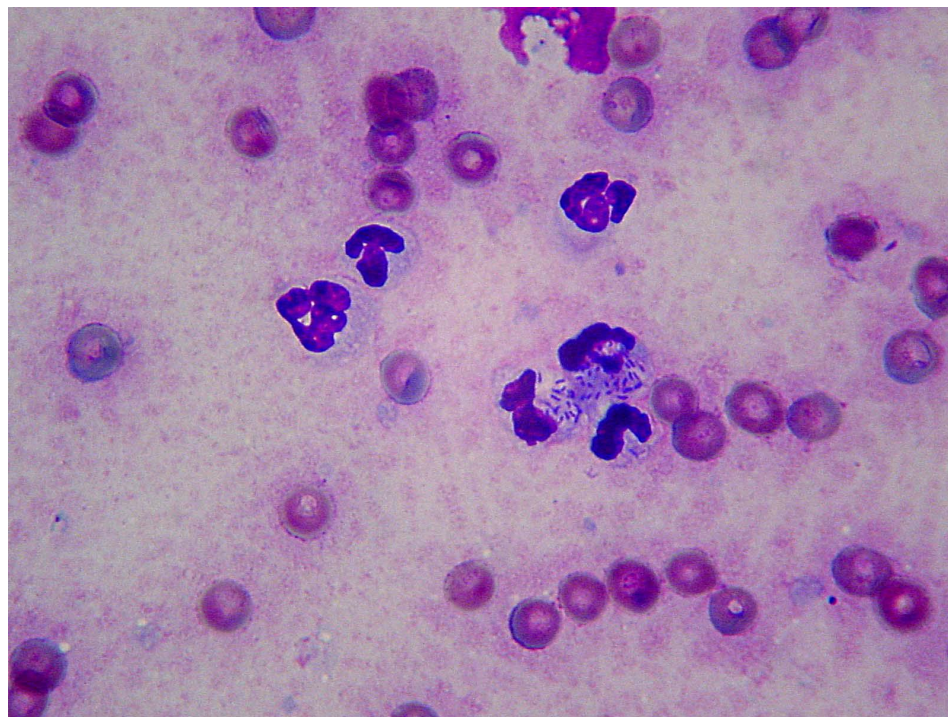
DISCIPLINE COMPLEMENTARI ALLA BATTERIOLOGIA

VERSAMENTI CAVITARI



DISCIPLINE COMPLEMENTARI ALLA BATTERIOLOGIA

LIQUIDO SINOVIALE



INTERPRETARE AL MEGLIO IL REFERTO

RISULTATO NEGATIVO

- campionamento inadeguato
- presenza di sostanze inibenti
- presenza di essudato purulento/neutrofili
- bassa carica batterica
- inadeguata conservazione del campione



INTERPRETARE AL MEGLIO IL REFERTO

RISULTATO NEGATIVO

- inadeguato mezzo di trasporto
- incapacità da parte del batterio di crescere in vitro
- batteri presenti ma inibiti o morti a causa della risposta immunitaria dell'ospite



INTERPRETARE AL MEGLIO IL REFERTO

RISULTATO NEGATIVO

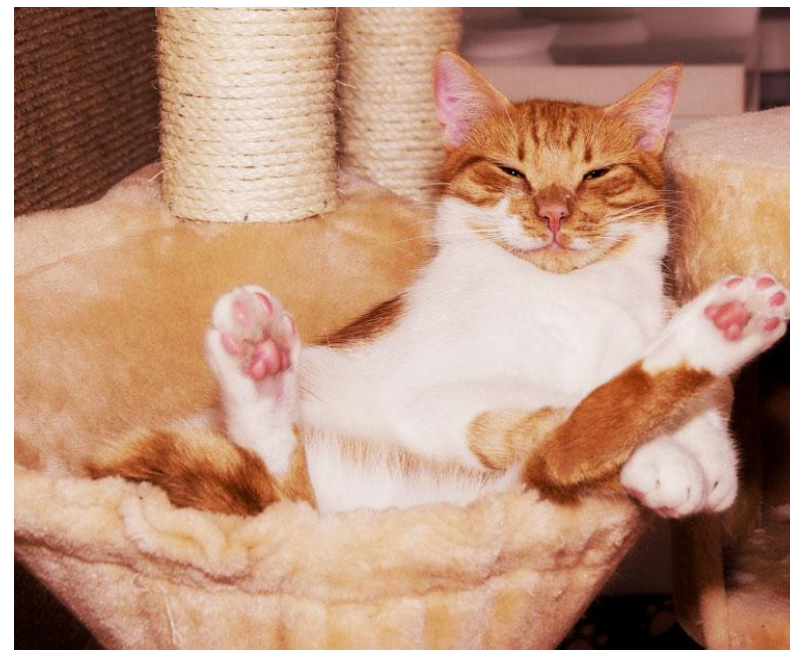
- esposizione protratta all'aria in caso di campioni provenienti da siti con batteri anaerobi stretti
- presenza di batteri esigenti (ad es. Salmonella) e/o a crescita lenta (es. Actinomyces/Nocardia)
- CUT OFF (urine, tamponi vaginali)
- CONTAMINANTI



INTERPRETARE AL MEGLIO IL REFERTO

RISULTATO POSITIVO

- compatibilità germe isolato
- necessità di terapia antibiotica
- presenza di più di un germe



INTERPRETARE AL MEGLIO IL REFERTO

Esistono delle LINEE GUIDA internazionali alle quali è importante attenersi!!!

Esempio:

- *Weese JS et al. International Society for Companion Animal Infectious Diseases (ISCAID) guidelines for the diagnosis and management of bacterial urinary tract infections in dogs and cats. Vet J. 2019 May*
- *Lappin MR et al. Antimicrobial use Guidelines for Treatment of Respiratory Tract Disease in Dogs and Cats: Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases. J Vet Intern Med. 2017 Mar*

INTERPRETARE AL MEGLIO IL REFERTO

REFERTO QUALITATIVO VS REFERTO QUANTITATIVO

E.coli

AMPICILLINA	S
ENROFLOXACINA	S
COTRIMOXAZOLO	R
NITROFURANTOINA	R

E.coli

800 UFC/mL

AMPICILLINA	S	$\leq 2 \mu\text{g/mL}$
ENROFLOXACINA	S	$0,5 \mu\text{g/mL}$
COTRIMOXAZOLO	R	$\geq 320 \mu\text{g/mL}$
NITROFURANTOINA	R	$128 \mu\text{g/mL}$

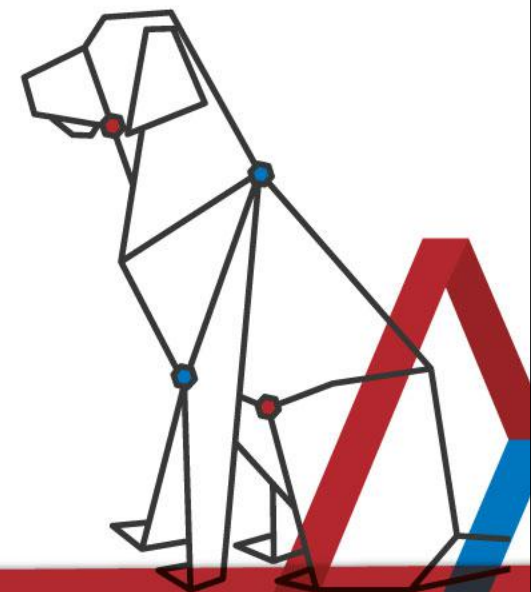
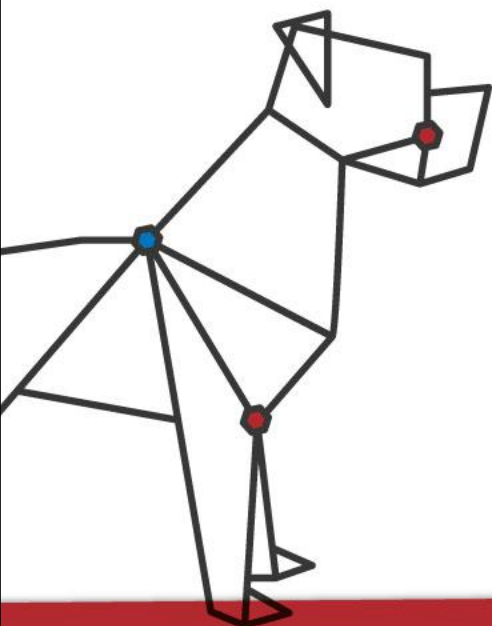


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L'ESAME BATTERIOLOGICO NELLE FOLLICOLITI BATTERICHE SUPERFICIALI DEL CANE

Federico Leone

Clinica Veterinaria Adriatica – Senigallia (Ancona)
Consulente Dermatologia Otologia Allergologia
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Follicolite batterica superficiale

Forma più comune di piodermite nel cane

Principale motivo di utilizzo di antibiotico in dermatologia veterinaria

Patogeno principale

- *Staphylococcus pseudintermedius*

Meno frequentemente

- *Staphylococcus aureus*
Staphylococcus schleiferi

Veterinary Dermatology

Vet Dermatol 2014; 25: 163–e43

DOI: 10.1111/Adv.12118

Guidelines for the diagnosis and antimicrobial therapy of canine superficial bacterial folliculitis (Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases)

Andrew Hillier*, David H. Lloyd†, J. Scott Weese‡, Joseph M. Blondeau§, Dawn Boothe¶, Edward Breitschwerdt**, Luca Guardabassi††, Mark G. Papich**, Shelley Rankin‡‡, John D. Turnidge§§ and Jane E. Sykes¶¶

Raramente

- *Pseudomonas aeruginosa* e altri batteri Gram-negativi

Follicolite batterica superficiale - corretto approccio

Diagnosi corretta di
follicolite batterica

Risoluzione delle lesioni
cutanee causate
dall'infezione batterica

- Selezione dell'antibiotico appropriato
- Garantire dose e frequenza di somministrazione corretta

Diagnosi
eliminazione/controllo
della causa/e
favorente/i

1. Diagnosi corretta follicolite batterica – aspetti clinici



Papule pustole



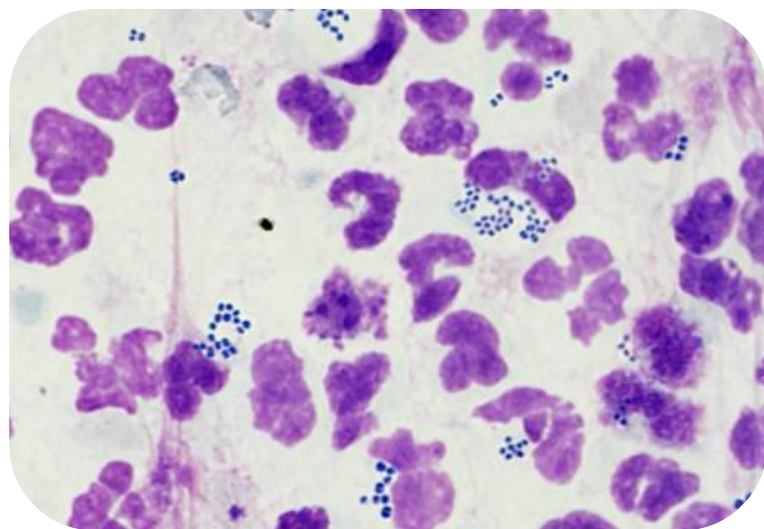
Collaretti epidermici



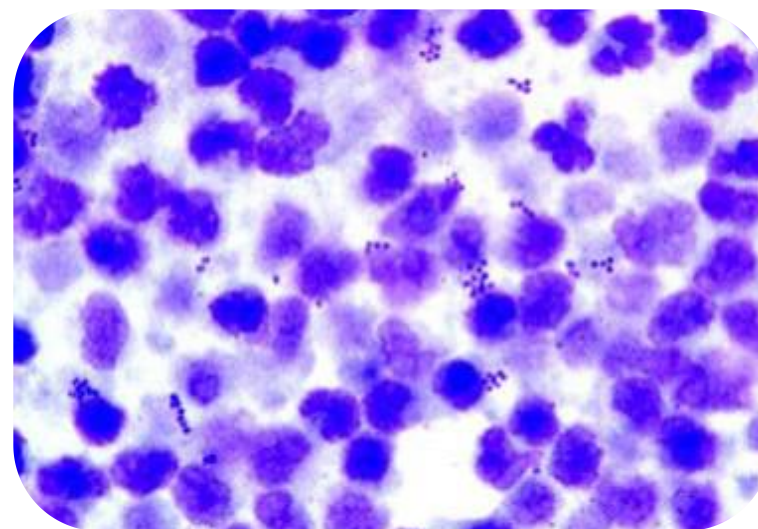
Alopecia multifocale
(mantello tarmato)

- Razze a pelo corto

1. Diagnosi corretta follicolite batterica – aspetti citologici

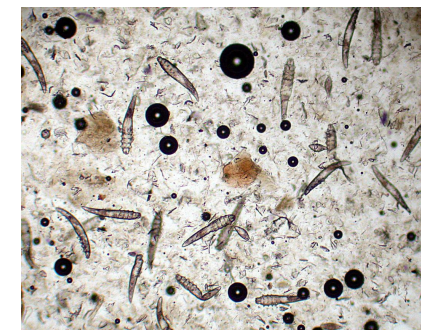
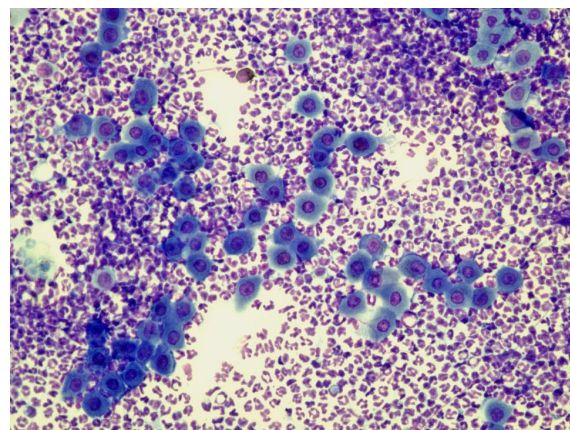
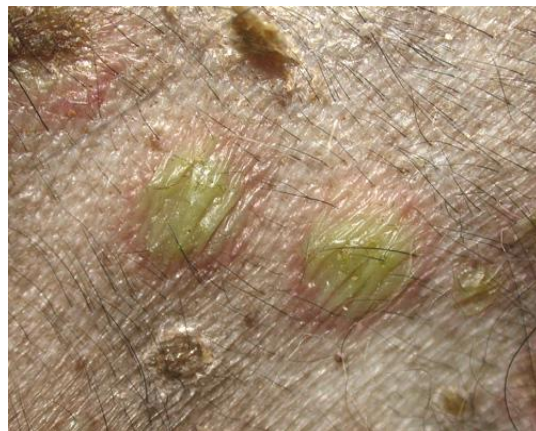


Granulociti neurofili
che fagocitano batteri



Degenerazione dei
granulociti neutrofili

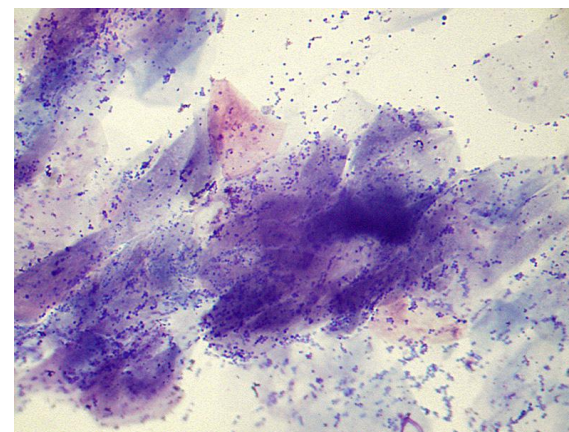
1. Diagnosi corretta follicolite batterica – DD



2. Esame batteriologico e antibiogramma

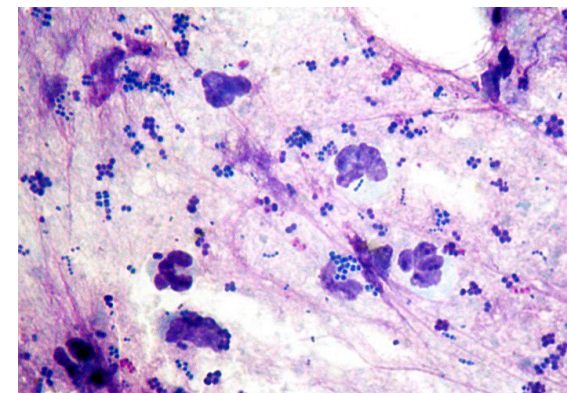
- Utilità limitata nella diagnosi iniziale di piodermite

- Non può differenziare cute colonizzata e infetta
 - Sovracrescita, colonizzazione o infezione?



- Sempre associato all'esame citologico

- Scopo principale di aiutarci nella scelta della terapia sistemica



2. Esame batteriologico e antibiogramma – quando farlo?

Se possibile SEMPRE se
pensiamo di utilizzare
un antibiotico sistemico



Diffusione allarmante di
antibiotico resistenza

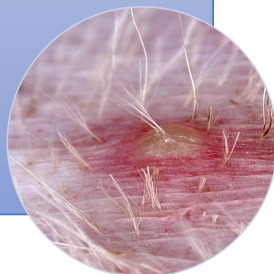
Obbligatorio in caso di:

- **Insuccessi terapeutici**
 - Meno del 50% di riduzione delle lesioni dopo 2 settimane di terapia
 - Comparsa di nuove lesioni dopo 2 settimane di terapia
 - Lesioni residue di infezioni superficiali dopo 6 settimane con presenza di cocci
- **Bastoncelli in citologia**
 - Profilo di sensibilità agli antibiotici non prevedibile
- **Rischio di esposizione a batteri resistenti**
 - Infezione resistente in passato
 - Altro animali con infezioni multiresistenti in casa

2. Esame batteriologico e antibiogramma – come farlo?

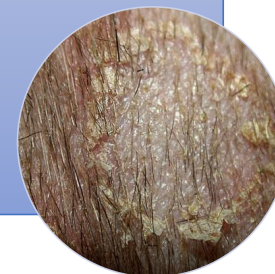
- No disinfezione
- Rompere la pustola con ago sterile
- Se essudato è visibile su ago spruzzare su tampone sterile
- Altrimenti toccare l'essudato con tampone sterile

Pustole (ideali
lesioni chiuse)

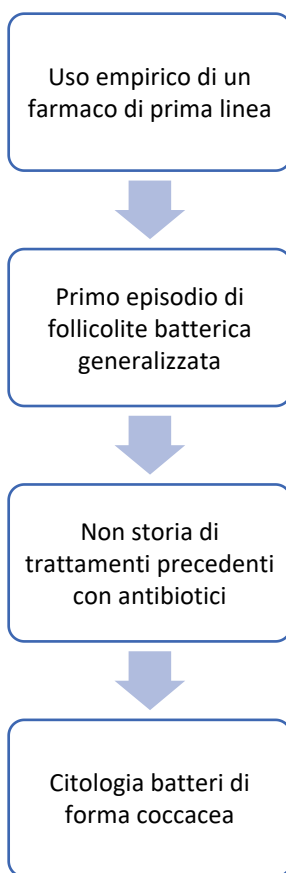


- No disinfezione
- Sollevare bordo con strumento sterile
- Toccare essudato sottostante con tampone sterile

Collaretti
epidermici



2. Scelta dell'antibiotico



Antibiotici di prima linea

Efficacia documentata Stafilococchi
Scarsi effetti indesiderati

Cefalessina Cefadrossile

Amoxicillina-acido clavulanico

Clindamicina Lincomicina

Cefovecina

(Difficoltà somministrazione/scarsa compliance)

2. Scelta dell'antibiotico

Antibiotici di seconda linea

Solo e sempre dopo esame batteriologico e antibiogramma
In caso di resistenza comprovata a molecole di prima linea

Cefalosporine di terza generazione

- Cefovecina-Cefpodoxime

Chinolonic

- Enrofloxacin-Marbofloxacin-Pradofloxacin

Tetracicline

- Doxiclina-Minociclina

Trimetoprim-sulfamidico

2. Scelta dell'antibiotico

Antibiotici di terza linea

Solo e sempre dopo esame batteriologico e antibiogramma

Scarsi dati su efficacia e sicurezza nel cane

Amikacina-Gentamicina	Piperacillina
Rifampicina	Imipenem
Azitromicina	Vancomicina
Claritromicina	Teicoplanina
Ceftazidime	Linezolid

2. Scelta dell'antibiotico

Antibiotici di terza linea

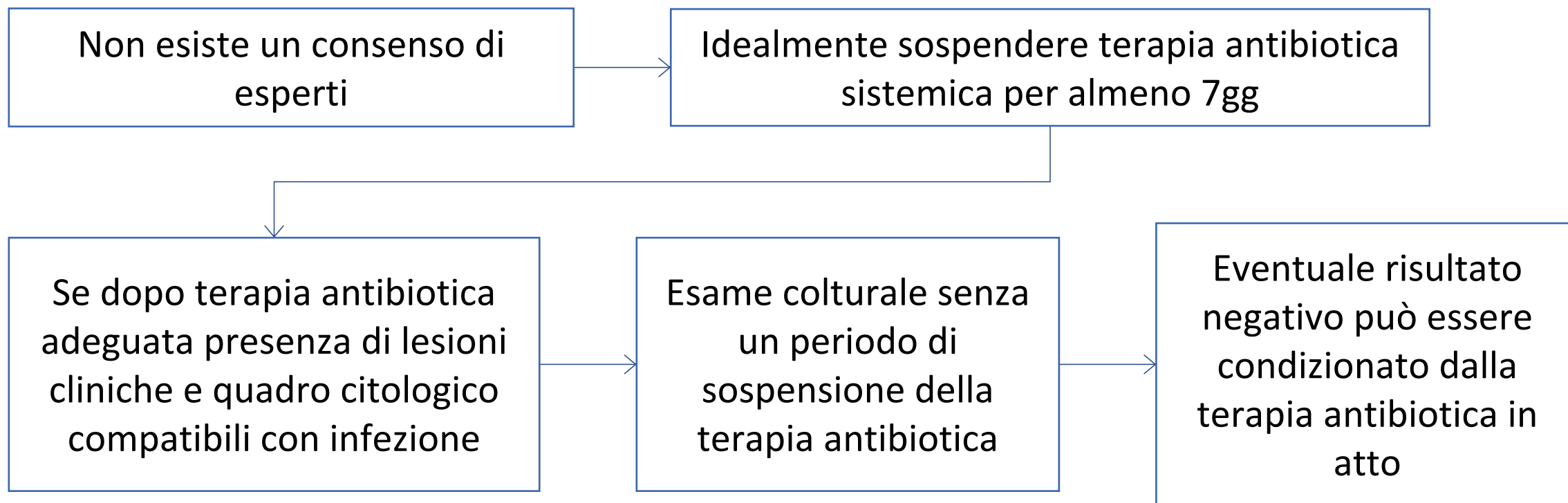
Solo e sempre dopo esame batteriologico e antibiogramma

Scarsi dati su efficacia e sicurezza nel cane

Amikacina-Gentamicina	Piperacillina
Rifampicina	Imipenem
Azitromicina	Vancomicina
Claritromicina	Teicoplanina
Ceftazidime	Linezolid

Dovrebbero essere riservati per il trattamento di gravi infezioni da MRSA nell'uomo

2. Tempo di sospensione prima di eseguire esame colturale

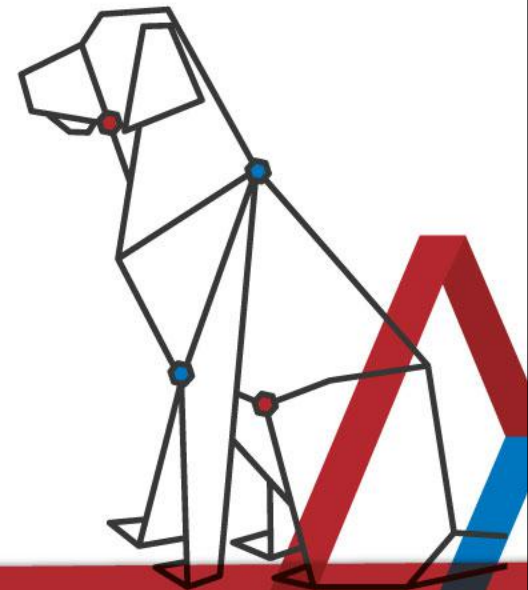
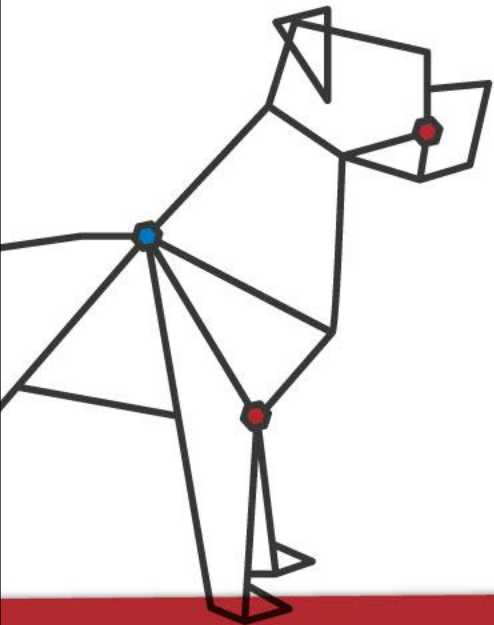


Quanto è importante la batteriologia nella pratica clinica quotidiana?

Infezioni delle vie urinarie

Francesco Dondi
DVM PhD Ricercatore
Dipartimento di Scienze Mediche Veterinarie
Alma Mater Studiorum - Università di Bologna

Nefrologia e Urologia



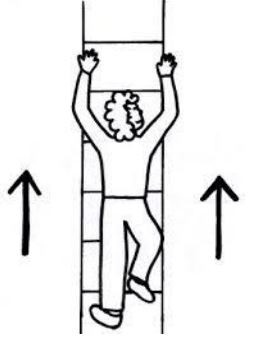
UTI

NON
COMPLICATE

COMPLICATE

- Cistite sporadica
- Cistite ricorrente
- Pielonefrite
- Prostatite
- Batteriuria asintomatica
- Infezioni associate al cateterismo
- Chirurgia urologica
- Dissoluzione medica uroliti

UTI - Patogenesi



Via ascendente

→ è la via prevalente di infezione

Cateterismo

→ inocula sempre batteri nel tratto urinario ≠ CAUTI

Via ematogena

→ vie urinarie per diagnosi di sepsi

Valutare se un ***paziente è sintomatico*** per UTI

Se sintomatico ... → trattare

Cosa significa "essere sintomatico" ?





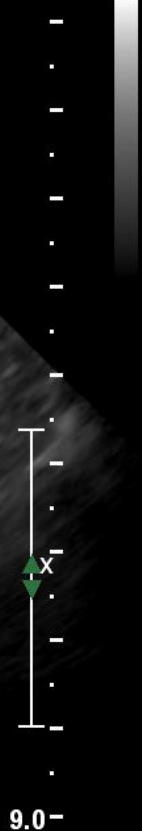
AC 1200003666 Serv.Ecografia Vet.UNIBO C8-5/ADDOME CANE

FR 24Hz
Ris./Vel.

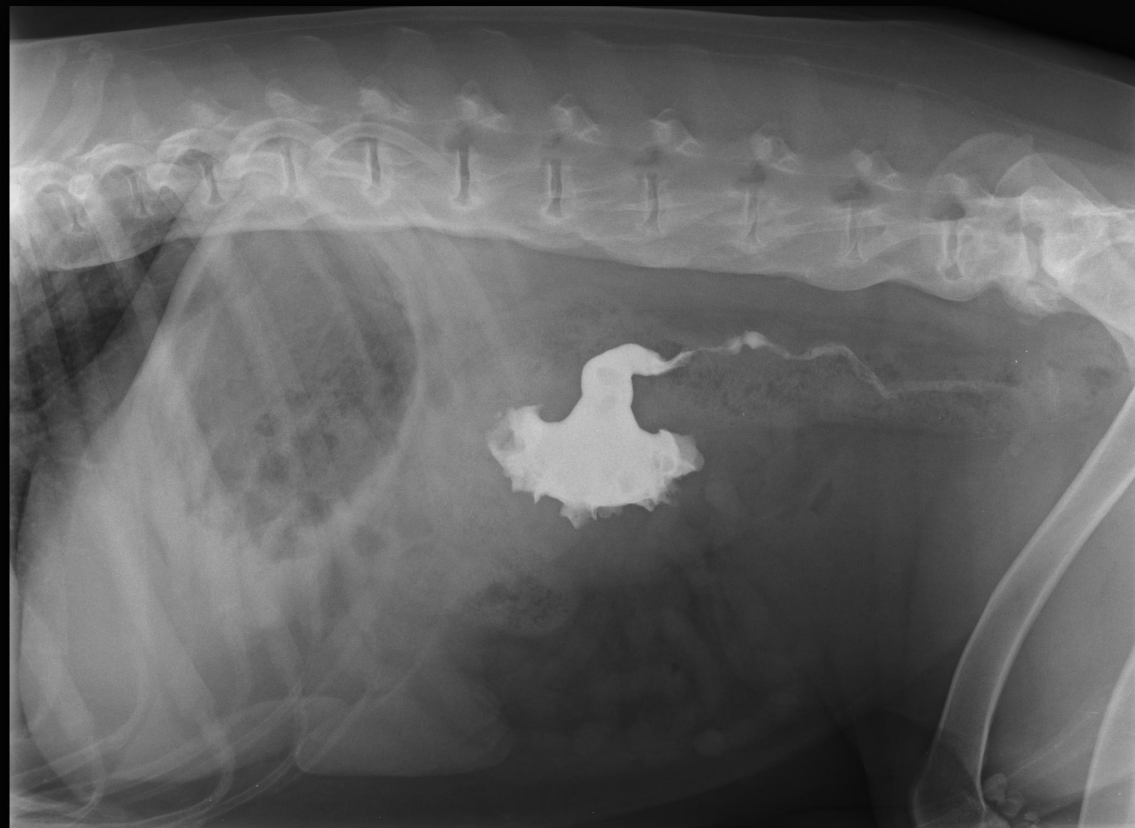
2D
64%
C 70
P Off
Gen.

M3

P



Rene sx



Quando e perché ricorrere all'*esame batteriologico* in corso di UTI?

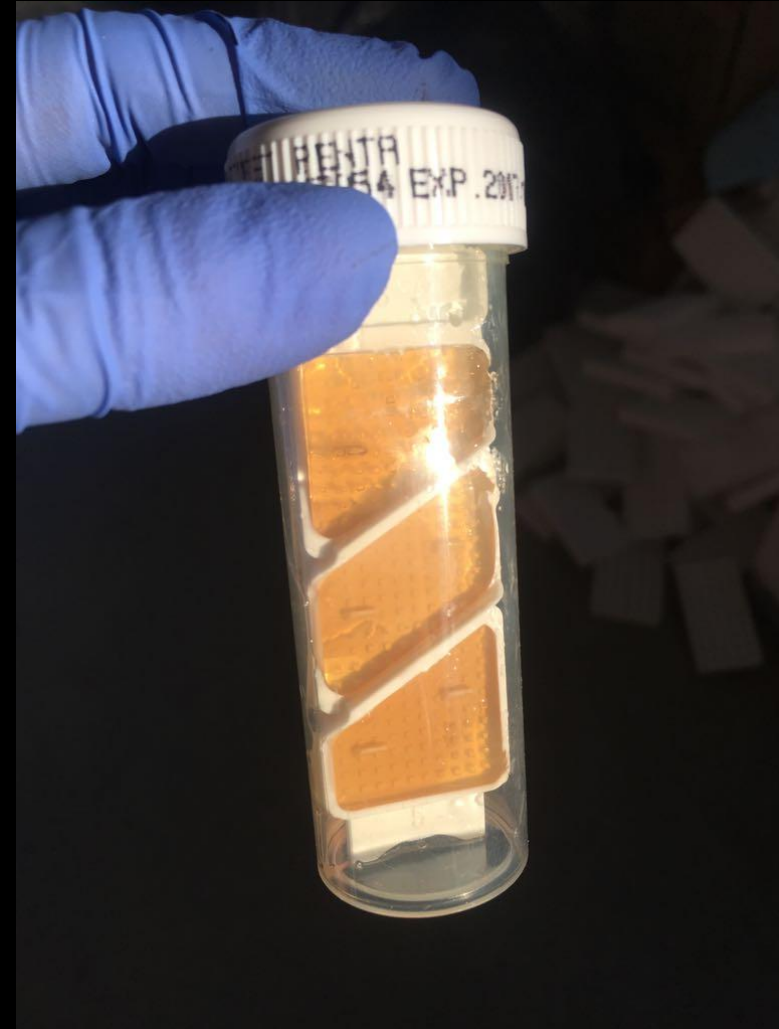
Sempre per la diagnosi !

UTI – Diagnosi

- Segni clinici
- Analisi delle urine (PS + dipstick)
- Esame a fresco del sedimento (100-400X)
- Citologia del sedimento (1000X)
- *Esame batteriologico*

Cistocentesi

URIPENTA



Cortesia Dr Walter Bertazzolo

Table 4

Situations where urine culture may be considered in dogs and cats that do not have lower urinary tract signs.

Situations where screening may be indicated	Suspected pyelonephritis Investigation of the bladder as a source of bacteremia/septicemia Patients that are to undergo a surgical or minimally invasive procedure that will involve entering or transection of the urinary tract Dogs with suspected struvite urolithiasis
Situations where screening is sometimes performed but the relevance is unclear	Diabetic patients that are difficult to regulate or are ketoacidotic Animals with spinal cord disease that cannot reliably display evidence of lower urinary tract disease

The Veterinary Journal 247 (2019) 8–25



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journal homepage: www.elsevier.com/locate/tvj



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J. Scott Weese^{a,*}, Joseph Blondeau^{b,c}, Dawn Boothe^d, Luca G. Guardabassi^{e,f}, Nigel Gumley^g, Mark Papich^h, Lisbeth Rem Jessenⁱ, Michael Lappin^j, Shelley Rankin^k, Jodi L. Westropp^l, Jane Sykes^l

Table 2. Bacterial isolates identified in canine urinary tract infections (UTI) classified as uncomplicated UTI, complicated UTI and pyelonephritis. *P* value based on Fisher's exact test for difference in proportion of isolates in uncomplicated and complicated UTIs.

	All Organisms % (n)
Total	(1636)
Gram positive	31.0 (508)
<i>Staphylococcus</i> spp.	13.7 (224)
<i>Enterococcus</i> spp.	13.4 (220)
Other Gram positive ^a	3.9 (64)
Gram negative	68.9 (1128)
Enterics	65.1 (1065)
<i>Escherichia coli</i>	52.4 (858)
Non-hemolytic	29.9 (489)
Hemolytic	22.7 (371)
<i>Proteus mirabilis</i>	5.4 (89)
<i>Enterobacter</i> spp.	1.8 (29)
<i>Klebsiella</i> spp.	3.7 (61)
Other gram negative enterics ^b	1.7 (28)
Non-enterics	3.9 (63)
<i>Pseudomonas</i> spp.	2.0 (33)

Nonenterics: *Acinetobacter baumannii*, *Alcaligenes faecalis*, *Pasteurella* spp., *Providencia rettgeri*, *Stenotrophomonas maltophilia*.

^a*Aerococcus viridans*, *Corynebacterium* spp., *Lactobacillus* spp., *Lactococcus* spp., *Micrococcus* spp., *Streptococcus* spp.

^b*Citrobacter* spp., *Salmonella enteritidis*, *Serratia marcescens*, *Yersinia enterocolitica*.

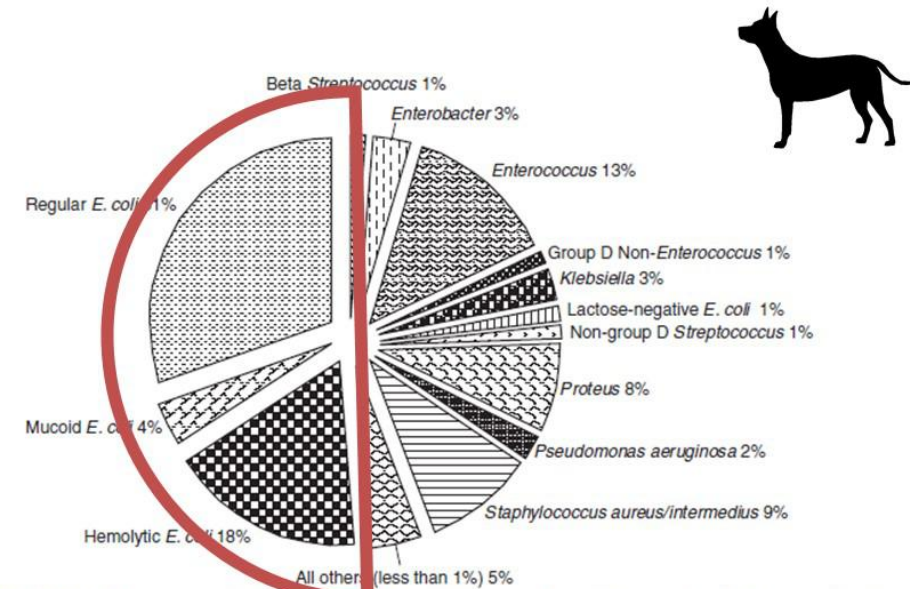


FIGURE 8-1 ■ Bacteria associated with urinary tract infection in dogs. Organisms isolated in significant quantitative growth from cystocentesis samples in dogs. 5,060 urine samples were cultured yielding growth in 28% and no growth in 72%. Organisms listed as less than 1% each (<5% total) included *Acinetobacter*, *Citrobacter*, *Clostridium*, coagulase-negative *Staphylococcus*, *Corynebacterium* sp, *Klebsiella oxytoca*, *Lactobacillus*, *Malassezia*, *Mycoplasma*, *Pasteurella multocida*, *Pasteurella* sp, *Pseudomonas* sp, *Serratia*, and yeast. (Courtesy of The Ohio State University Microbiology Laboratory, January 2000-April 2007.)

UTI - trattamento

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Table 3

Drug table summarizing recommendations for the management of bacterial urinary tract infection in dogs and cats.

Drug (WHO category) ^a	Dose	Comments
Amikacin (CIA)	Dogs: 15–30 mg/kg IV/IM/SC every 24 h Cats: 10–14 mg/kg IV/IM/SC every 24 h	Not recommended for routine use but may be useful for treatment of multidrug resistant organisms. Potentially nephrotoxic. Avoid in animals with reduced kidney function. Other factors (e.g. low pH) can affect aminoglycoside activity, which should be considered. Care should be taken when using it in combination with nephroactive drugs (e.g. NSAIDs).
Amoxicillin (CIA)	11–15 mg/kg PO every 8–12 h	Good first-line option for sporadic bacterial cystitis. Excreted in urine predominantly in active form if normal kidney function is present. <i>Klebsiella</i> spp. are resistant. Ampicillin is used in susceptibility tests to predict activity of amoxicillin. Breakpoint for susceptibility testing is ≤ 0.25 μ g/mL for systemic infections but a breakpoint of ≤ 8 μ g/mL can be used for lower urinary tract infections owing to high urine concentrations. Not recommended for pyelonephritis or prostatitis.
Amoxicillin/clavulanic acid (CIA)	12.5–25 mg/kg PO every 12 h Note: dose of total product (amoxicillin + clavulanic acid)	Not established whether there is any advantage over amoxicillin alone for sporadic bacterial cystitis. Reasonable empiric choice for cystitis when regional susceptibility data support a high prevalence of resistance to amoxicillin but susceptibility to amoxicillin/clavulanic acid.
Ampicillin (CIA)		Not recommended for pyelonephritis or prostatitis. Breakpoint for susceptibility testing is ≤ 0.25 μ g/mL for systemic infections but a breakpoint of ≤ 8 μ g/mL can be used for lower urinary tract infections owing to high urine concentrations.
Cefazolin (HIA)	22 mg/kg IV ~30 min prior to the procedure.	Not recommended because of poor oral bioavailability. Amoxicillin is preferred. Ampicillin is used in susceptibility tests to predict activity of amoxicillin. Main use is for peri-procedure prophylaxis as a single pre-procedure dose. Cefazolin, at a breakpoint of ≤ 16 μ g/mL can also be used to predict activity of oral cephalosporins.
Cefovecin (HP-CIA)	8 mg/kg single SC injection. Can be repeated once after 7–14 days.	Duration and spectrum are longer than is typically needed, so not recommended for routine use. Should only be used in situations where oral treatment is not possible. <i>Enterococcus</i> spp. are resistant. Pharmacokinetic data are available to support a duration of 14 days in dogs and 21 days in cats.
Cefpodoxime proxetil (HP-CIA)	Dogs: 5–10 mg/kg every 24 h PO Cats: no dose established.	More active than cephalexin or cefadroxil against Enterobacteriaceae when using the breakpoint of 2 μ g/mL for interpretation. <i>Enterococcus</i> spp. are resistant.
Ceftiofur (HP-CIA)	Dogs: 2 mg/kg every 12–24 h SC Cats: no dose established.	Approved for treatment of bacterial cystitis in dogs in some regions. <i>Enterococcus</i> spp. are resistant.
Cefuroxime (HIA)	Peri-operative prophylaxis: 20–50 mg/kg slow IV	2nd generation cephalosporin that can be used peri-operatively. <i>Enterococcus</i> spp. are resistant.
Cephalexin, cefadroxil (HIA)	12–25 mg/kg PO every 12 h	Narrow-spectrum activity; not active against Enterobacteriaceae when using the current breakpoint of 2 μ g/mL but CLSI has recently revised the breakpoint to < 16 μ g/mL, consistent with human medicine. <i>Enterococcus</i> spp. are resistant.
Chloramphenicol (HIA)	Dogs: 40–50 mg/kg PO every 8 h Cats: 12.5–20 mg/kg (to a maximum of 50 mg/cat) PO every 12 h	Reserved for multidrug resistant infections with few other options. Myelosuppression can occur, particularly in cats and with long-term (e.g. >28 days) therapy. Avoid contact by humans because of rare idiosyncratic aplastic anemia. Not a first line treatment for pyelonephritis or prostatitis. Sometimes used because of lower cost than veterinary fluoroquinolones. Lower and more variable oral bioavailability than approved veterinary fluoroquinolones. Difficult to justify over approved fluoroquinolones. Dosing recommendations are empirical and based on limited pharmacokinetic studies. No interpretive criteria are available for testing isolates from animals as CLSI recommends that human breakpoints not be used for testing canine isolates. Not recommended for prostatitis.
Ciprofloxacin (HP-CIA)	25–30 mg/kg PO every 24 h	Not excreted in urine at high levels but can achieve levels that are effective against some pathogens. Reserved for infections caused by pathogens that are resistant to drugs that are actively excreted in urine in active form. Care should be taken with administration recommendations in cats to reduce the risk of esophageal ulceration.
Doxycycline (HIA)	5 mg/kg PO every 12 h	Excreted in urine predominantly in active form. Reserve for documented resistant infections but initial/empirical choice for pyelonephritis and prostatitis in dogs at the higher end of the dosing range. Not recommended for <i>Enterococcus</i> spp. Associated with risk of retinopathy in cats. It is recommended to avoid enrofloxacin in cats. If it must be used, a dose of 5 mg/kg per day should not be exceeded.
Enrofloxacin (HP-CIA)	5 mg/kg PO every 24 h (cats) 5–20 mg/kg every 24 h (dogs)	Should be reserved for multidrug resistant infections. Do not use in cats. Potential option for pyelonephritis and prostatitis, dosed every 8 h.
Fosfomycin (CIA)	40 mg/kg PO (with food) every 12 h	Reserve for treatment of multidrug resistant infections, particularly those caused by ESBL-producing Enterobacteriaceae or <i>Pseudomonas aeruginosa</i> .
Imipenem-cilastatin (CIA)	5 mg/kg IV/IM every 6–8 h	<i>Enterococcus faecium</i> is inherently resistant. Recommend consultation with a urinary or infectious disease veterinary specialist or veterinary pharmacologist prior to use.
Levofloxacin (HP-CIA)	25 mg/kg PO every 24 h (dogs)	Sometimes used as a lower cost fluoroquinolone. Licensed fluoroquinolones should be used when possible. High oral bioavailability in dogs.
Marbofloxacin (HP-CIA)	2.7–5.5 mg/kg PO every 24 h	Excreted in urine predominantly in active form. Reserve for documented resistant infections but good first line choice for pyelonephritis. Considered first-line choice for infections that involve the prostate. Not recommended for <i>Enterococcus</i> spp.

Terapia antibatterica



Cistite sporadica

3-5 gg

Cistite ricorrente

3-5 → 7-14 o oltre → valutare se ricompare !

Pielonefrite

7-14 gg → 4-6 settimane ?

Prostatite

4-6 settimane

Batteriuria asintomatica

non trattare

Infezioni associate al cateterismo

trattare dopo cateterismo come «cistite sporadica»

Chirurgia urologica

3-5 gg → 60 min prima → poi 24 h → 3-5 gg

Dissoluzione medica uroliti

come cistite sporadica (?)

Monitoraggio batteriologico delle UTI “complicate” ?

Batteriologico e Antibiogramma	Obiettivi
Prima di iniziare il trattamento	Identificare i batteri e determinarne la suscettibilità
3-5-7 giorni dopo l'inizio del trattamento	Documentarne l'effettiva eliminazione dei batteri Escludere infezione refrattaria Cambiamento della MIC se persiste? Insorgenza rapida di resistenza?
3-5 giorni prima della sospensione del trattamento	Escludere super-infezioni (rare) Identificato nuovo microrganismo ?
7-10 giorni dopo la sospensione del trattamento	Escludere la recidiva
1, 2, 3, 6 e 12 mesi dopo il trattamento	Identificare eventuali nuove reinfezioni (o recidive)

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Rivalutazione batteriologica dopo 7-14 gg dalla sospensione e poi decidere cosa fare:

- Ritrattare se rimane sintomatico
- Se ancora positivo batteri ma “asintomatico” valutare di trattare come Batteriuria asintomatica



Rimini 24/26
maggio 2019

