

BEST PRACTICE MANAGEMENT OF BACTERIAL SKIN INFECTIONS

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TIME TO CHANGE

BEST PRACTICE MANAGEMENT OF BACTERIAL SKIN INFECTIONS



DIAGNOSIS			INITIAL TREATMENT	RE-CHECKS		MAINTENANCE				
Confirm type of infection:			Resolve infection	Confirm progress & look for signs of primary disease (NOTE: microbial skin infections should always be thought of as secondary)		Prevent recurrence				
1. Clinical signs: lesion type and distribution will suggest the depth of pyoderma	2. Cytology: the presence of cocci (+/- rods, Malassezia spp.) and inflammatory cells confirm infection	3. Start search for primary cause of infection (e.g. ectoparasites)	Select antimicrobial therapy following principles for good antimicrobial stewardship	All clinical signs resolved	Infection has resolved (e.g. no pus, pustules, exudate) BUT other clinical signs persist	Infection NOT resolved	Primary disease identified & can be corrected	Primary disease diagnosed/suspected but may be difficult to correct OR: primary disease NOT identified		
SURFACE PYODERMA Bacterial overgrowth/surface pyoderma/GSD Hot spot/surface pyoderma/St. Bernhard Intertrigo/surface pyoderma/ventral neck pug			CLINICAL SIGNS Varied depending on presentation e.g. erythema, hyperpigmentation, lichenification, erosion NOTE: Acute moist dermatitis – differentiate from deep pyoderma (should be acute & no satellite lesions present) STRONGLY RECOMMENDED: CYTOLOGY • Identifies the pathogen • Informs treatment choice (e.g. intertrigo associated with yeast or bacteria) • Helps to monitor progress	TOPICAL therapy alone NOTE: The use of systemic antimicrobials for surface pyoderma is no longer indicated for uncomplicated cases of surface (& superficial) pyoderma (exception: mucocutaneous pyoderma may require systemic therapy) Proven clinical and in vitro efficacy for: Chlorhexidine (2-3% or in combination with miconazole) Fusidic acid as gel or ointment; good in vitro efficacy against staphylococci, including MRSA/MRSP. Antibacterial products should be used according to data sheet recommendations or more frequently for localised areas (up to daily) Acute moist dermatitis: topical or systemic glucocorticoids indicated to treat the underlying inflammation Re-examine after 2 weeks except for acute moist dermatitis (re-examine after 2-5 days)	• Search for signs indicative of original cause for infection (e.g. review ectoparasite control, history of allergic disease) • Make owner aware of potential future recurrences & need for monitoring • Continue treatment until 1 week beyond clinical resolution, then stop	ESSENTIAL: Repeat CYTOLOGY to confirm that infection has resolved (squames and low numbers of bacteria) • If signs of inflammation persist (or seen elsewhere e.g. ears, interdigital skin) - consider inflammatory triggers (hypersensitivities, immune mediated) and further diagnostic tests (e.g. biopsy) • Other abnormalities elsewhere e.g. folds, signs of systemic disease – record, investigate, correct	ESSENTIAL: Repeat CYTOLOGY if large numbers of bacteria and inflammatory cells remain • Check compliance • Submit swab for bacterial culture & antimicrobial susceptibility testing NOTE: Drug resistance is an unlikely cause for treatment failure if using licensed topical treatments. Drug concentrations can be expected to be substantially above MICs at the site of infection, at least where biofilms are not involved • Consider changing type of product to enhance compliance and reduce the risk for adverse reactions • Pursue diagnosis or management of underlying disease	• Correct underlying primary problem (e.g. corrective surgery for folds) • Once primary problem corrected, no need for ongoing antimicrobial treatment	Long-term antimicrobial maintenance therapy with TOPICAL treatment: • Monitor compliance and treatment efficacy using cytology, e.g. monthly or when clinical signs worsen • Continue/repeat diagnostic tests, e.g. after six months to pursue a diagnosis • Manage underlying suspected allergic disease empirically, e.g. using topical glucocorticoid therapy to prevent recurrent infection Re-examine annually or sooner if skin lesions occur • Monitor using CYTOLOGY • Re-examine monthly initially, then less frequently as required	
SUPERFICIAL PYODERMA Superficial pyoderma groin/pustules and epidermal collarettes Mucocutaneous pyoderma on the lips of a Labrador (David Grant) Superficial pyoderma in a short-haired breed (moth-eaten appearance) (Chiara Noli)			CLINICAL SIGNS Papules, pustules (few), epidermal collarettes, erythema, alopecia (often 'moth eaten' appearance in short-haired breeds) STRONGLY RECOMMENDED: CYTOLOGY • Identifies the pathogen • Informs treatment choice • Determines need for bacterial culture (see below) • Establishes baseline to monitor progress BACTERIAL CULTURE & ANTIMICROBIAL SUSCEPTIBILITY TESTING: never contraindicated. ESSENTIAL IF: • Intracellular rod-shaped bacteria on cytology • History of repeated courses of antimicrobials • Previous antibacterial therapy has failed • Prior history of multidrug resistant infection in the patient or in a pet from same household • High prevalence of MRSA, MRSP in practice or region	TOPICAL therapy alone • Use shampoos, gels, wipes with proven efficacy ² Correct application: Shampoos: • 2-3 times per week for 3 weeks, 10 minutes contact time • Ideal for widespread disease Gels: • Once or twice daily for localised lesions • Educate owner that response may take longer than with systemic therapy • Good efficacy proven in clinical studies (See also initial treatment for surface pyoderma) • Effective even against multidrug-resistant MRSA/MRSP • Requires compliant owner and dog ¹⁴	SYSTEMIC therapy chosen empirically if no risk factors for multidrug-resistance identified: • Clindamycin • Amoxicillin/clavulanic acid • Cefalexin • TMPs ³ Always combine with topical therapy where practical	• Search for signs indicative of original cause for infection (e.g. review ectoparasite control, history of allergic disease) • Make owner aware of potential future recurrences & need for monitoring and further diagnostic tests • Continue antimicrobial treatment until 1 week beyond clinical resolution, then stop	ESSENTIAL: Repeat CYTOLOGY from previously lesional sites to confirm that infection has resolved (squames and low numbers of bacteria) • Signs of inflammation or skin lesions persist (or are seen elsewhere e.g. ears, interdigital skin) - consider inflammatory triggers (ectoparasites, hypersensitivities, immune mediated disease) • Signs compatible with endocrine disease or unusual skin lesions persist – consider further diagnostic tests (blood tests, skin biopsy)	• Less than 50% reduction in extent of pyoderma lesions • New lesions emerging ESSENTIAL: • Repeat CYTOLOGY: Still large numbers of bacteria and inflammatory cells • Submit swab for BACTERIAL CULTURE & ANTIMICROBIAL SUSCEPTIBILITY TESTING • Check compliance • Review prescribed medication (correct dose & frequency?) Heightened infection control measures: Risk of MRSA/MRSP • Pursue diagnosis and management of underlying disease	• Correct underlying primary problem (e.g. hypothyroidism, food allergy) • No need for ongoing antimicrobial treatment • Make owner aware of the need for life-long control of underlying primary problem to prevent recurrent infection	Long-term antimicrobial maintenance therapy with TOPICAL therapy: • Monitor compliance and treatment efficacy • Consider combination of topical products or use at increased frequency • Continue/repeat diagnostic tests to pursue diagnosis of the primary disease • Continue monitoring for complicating ectoparasite-related disease • Manage underlying suspected allergic disease empirically, e.g. using topical glucocorticoid therapy to prevent recurrent infection • Consider systemic anti-inflammatory treatment to treat suspected allergic disease to prevent recurrence of infection Re-examine annually or sooner if skin lesions recur. • Monitor using CYTOLOGY • Re-examine monthly initially, then less frequently as required
DEEP PYODERMA Deep pyoderma/haemorrhagic crusts Deep pyoderma/drainng sinuses			CLINICAL SIGNS Papules, nodules, haemorrhagic crust, erythema, discharging sinus, plaques ESSENTIAL CYTOLOGY • Supports interpretation of culture results, helps identify which isolates are most relevant • Informs choice of systemic treatment while culture result pending • Sample deep infection (see below) ESSENTIAL BACTERIAL CULTURE & ANTIMICROBIAL SUSCEPTIBILITY TESTING • ALWAYS indicated as deep infections more frequently involve more resistant pathogens such as Gram negatives, take longer to improve and are more serious for the animal • Submit sample from deep infection, discharging sinus, aspirate, tissue from biopsies. NOT surface swabs! ESSENTIAL SEARCH FOR PRIMARY/CONCURRENT DISEASE EARLY • Check for hair plucks/skin scrapes (demodicosis?) • Additional tests depending on type and severity of other clinical signs (e.g. endocrine, allergic)	SYSTEMIC therapy based on bacterial culture & susceptibility test results: • Narrow-spectrum vs. broad-spectrum • Deliver at recommended dose range • Aim to treat for several weeks • Discuss cost with owner Combine with topical therapy where practical to aid resolution and support skin health • See also initial treatment for surface pyoderma ¹	• Search for signs indicative of original cause for infection (e.g. ectoparasites, allergic disease) • Continue monitoring for early endocrine or other disease • Make owner aware of potential future recurrences & need for monitoring and further diagnostic tests	ESSENTIAL: Repeat CYTOLOGY from previously lesional sites to confirm that infection has resolved (squames and low numbers of bacteria) • Signs of inflammation or skin lesions persist (or seen elsewhere e.g. ears, interdigital skin) - consider inflammatory triggers (ectoparasites, hypersensitivities, immune mediated disease) • Signs compatible with endocrine disease or unusual skin lesions persist - consider further diagnostic tests (blood work, biopsy) Search for primary/concurrent disease • Hair plucks/skin scrapes (demodicosis?) • Additional tests depending on type and severity of other clinical signs (e.g. endocrine, allergic)	• Very little improvement in pyoderma lesions or associated signs (discharge, pain etc.) or new lesions emerging ESSENTIAL: • Repeat CYTOLOGY: Still increased numbers of bacteria and inflammatory cells • Repeat bacterial culture and antimicrobial susceptibility testing • Check compliance • Review prescribed dose Heightened infection control measures: Risk of MRSA/MRSP • Pursue diagnosis and management of underlying disease	• Correct underlying primary problem (e.g. hypothyroidism, food allergy) • No need for ongoing antimicrobial treatment • Make owner aware of the need for life-long control of underlying primary problem to prevent recurrent infection	Repeat search for primary/concurrent disease at regular intervals: • Hair plucks/skin scrapes (demodicosis?) • Additional tests depending on type and severity of other clinical signs (e.g. endocrine, allergic) Long-term antimicrobial maintenance therapy with TOPICAL therapy: • See also initial treatment for surface pyoderma, but can be less frequent as required • Monitor compliance and treatment efficacy • Consider combination of topical products or use at increased frequency • Continue/repeat diagnostic tests to pursue diagnosis of the primary disease (including blood tests and imaging for systemic disease) • Continue monitoring for complicating ectoparasite-related disease • Manage underlying suspected allergic disease empirically, e.g. using topical glucocorticoid therapy to prevent recurrent infection • Consider systemic anti-inflammatory treatment to treat suspected allergic disease to prevent recurrence of infection (immediately AFTER infection has resolved) Re-examine annually or sooner if skin lesions recur • Monitor using CYTOLOGY • Re-examine monthly initially, then less frequently as required	

10 STEPS TO BEST PRACTICE MANAGEMENT OF BACTERIAL SKIN INFECTIONS



Diagnosis	<p>1 A detailed history and a comprehensive general physical examination are important to determine the predisposing primary disease. Consider age and breed as important factors.</p> <p>2 Always perform a thorough examination of the skin and evaluate the type and distribution of the skin lesions.</p> <p>3 Confirm microbial infection and type of pathogen using cytology. Combining 2-3 will determine the type of infection (surface, superficial, deep pyoderma, <i>Malassezia</i> dermatitis) and guide your treatment choice and prognosis.⁵</p>
Initial treatment	<p>4 Topical antimicrobial treatment can be effective alone in the treatment of surface and some cases of superficial pyoderma. Shampooing should always be part of the treatment for widespread lesions. Antimicrobial susceptibility testing is not required to choose topical agents as drug concentrations achieved at the site of infection will be high.</p> <p>5 For deep pyoderma and some cases of superficial pyoderma, systemic therapy is indicated. Empirical drug choices of first tier antimicrobials are appropriate for superficial pyoderma in areas with a low prevalence of MRSP and in animals that have not received antimicrobials repeatedly before.</p> <p>6 Bacterial culture and antimicrobial sensitivity testing is never contraindicated and always indicated to guide drug selection i) in deep pyoderma ii) when rods are seen on cytology iii) if there is a history of MRSA/MRSP and iv) immediately, if empirical treatment has failed (administered correctly, at the correct dose, for reasonable duration). Cytology along with bacterial culture and sensitivity testing will support correct interpretation of results.</p>
Re-checks & preventing recurrences	<p>7 Confirm that microbial infection has resolved by assessing clinical signs and cytology. Scheduled re-examinations are critical to determine drug-resistance early and for the diagnosis of primary diseases.</p> <p>8 Underlying primary diseases must be identified and corrected to prevent recurrences. Microbial skin infections are secondary to underlying primary disease or host-pathogen imbalance. These need to be diagnosed at re-check examinations when microbial infections have been resolved. Clinical signs remaining in the absence of infection will guide further diagnosis. Antimicrobial maintenance therapy using topical products may be indicated to prevent recurrences in cases where an underlying disease cannot be determined (idiopathic). Repeated, ongoing, low-dose or pulsed systemic antibiotics is no longer considered appropriate.</p>
Responsible use of antimicrobials	<p>9 Owner awareness and owner compliance will be critical to treatment success. Ensure owners understand i) the threat of antimicrobial drug resistance to human and animal health and ii) the opportunities of topical antimicrobial therapy as an alternative to systemic antimicrobials for some skin infections. It is important to provide thorough guidance to topical treatment via in-practice demonstrations, owner brochures or other visual resources.</p> <p>10 Awareness of and adherence to guidelines for antimicrobial use and practice hygiene protocols needs to be encouraged to limit the spread of multidrug-resistant and potentially zoonotic pathogens (FECVA www.fecava.org).</p>

ADDITIONAL INFORMATION

1. FECAVA advice on responsible use of antimicrobials. Chart to support your decision making and avoid unnecessary antimicrobial use. Poster available free at: www.fecava.org
2. Mueller *et al* (2012) A review of topical therapy for skin infections with bacteria and yeast. *Veterinary Dermatology* **23**(4):330-41, e62. doi:10.1111/j.1365-3164.2012.01057.
3. Loeffler *et al* (2011) Comparison of a chlorhexidine and a benzoyl peroxide shampoo as sole treatment in canine superficial pyoderma. *Veterinary Record*.
4. Borio *et al* (2015) Effectiveness of a combined (4% chlorhexidine digluconate shampoo and solution) protocol in MRS and non-MRS canine superficial pyoderma: a randomized, blinded, antibiotic-controlled study. *Veterinary Dermatology* **26**(5):339-44, e72.
5. Hillier *et al* (2014) 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. *Veterinary Dermatology* **25**(3):163-75, e42-3.

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