

Management of Exit-Site Infection



Exit-site Infection

- An exit-site infection is defined by the presence of purulent drainage with or without erythema of the skin at the catheter–epidermal interface.¹
- A tunnel infection is defined as the presence of clinical inflammation or ultrasonic evidence of fluid collection along the catheter tunnel.¹



Classification of Exit-site

Exit-site classification					
Sign/ Symptom	Perfect/Good	Equivocal	Acute infection <4 weeks	Chronic infection >4 weeks	Traumatized
Pain/ tenderness	None	None	May be present	May be present over cuff	Depends on severity of trauma
Color	Natural pale, pink, or dark	Bright pink <13 mm	Bright pink >13 mm	Natural, pale pink, purplish, or dark, bright pink <13 mm	Depends on severity of injury
Scab	None	None	May be present	May be present	Present
Crust	None	Present	Present	Present, may be difficult to detach	May be present

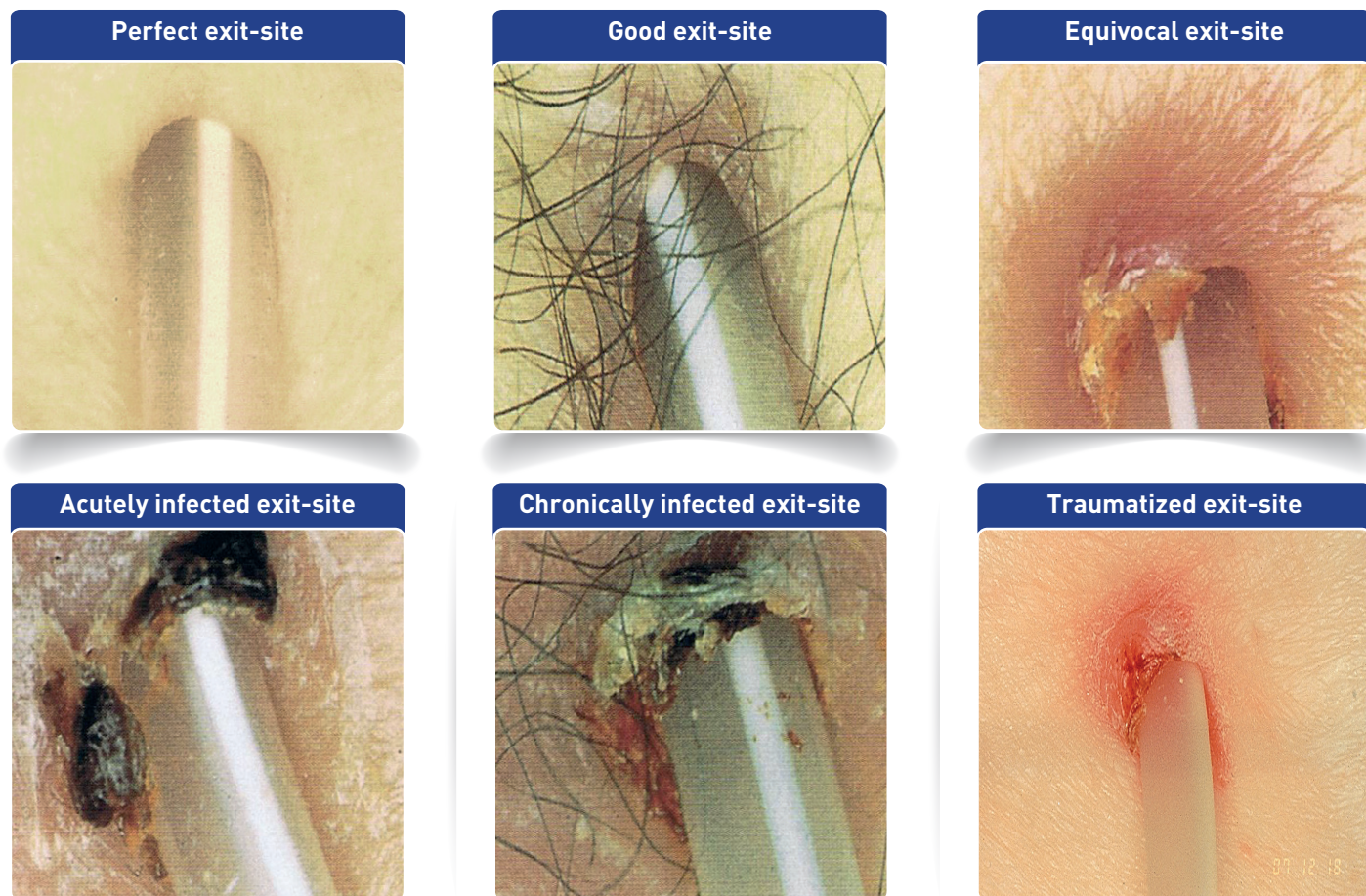
Drainage

External	None	None; dried exudate on dressing	Purulent or bloody; wet on dressing	Purulent or bloody, wet exudate on dressing	Bloody; may be purulent after 48 h
Sinus	None or barely visible	Purulent or bloody serous	Purulent or bloody	Purulent or bloody	Bloody; may be purulent after 48 h

Granulation tissue

External	None	Plain or slightly exuberant	Exuberant 'proud flesh' may be present	Exuberant 'proud flesh' typically visible	Plain or slightly exuberant
Sinus	None or barely visible	Slightly exuberant	Slightly exuberant or 'proud flesh' may be present	Exuberant or 'proud flesh' typically visible	Plain or slightly exuberant
Swelling	None	None	May be present	May be present	May be present
Epithelium	Strong, mature, covers visible sinus	Absent or covers part of sinus	Absent or covers part of sinus	Absent or covers part of sinus	May recede

Exit site infection is classified into the following categories based on appearance.



Exit-site scoring system

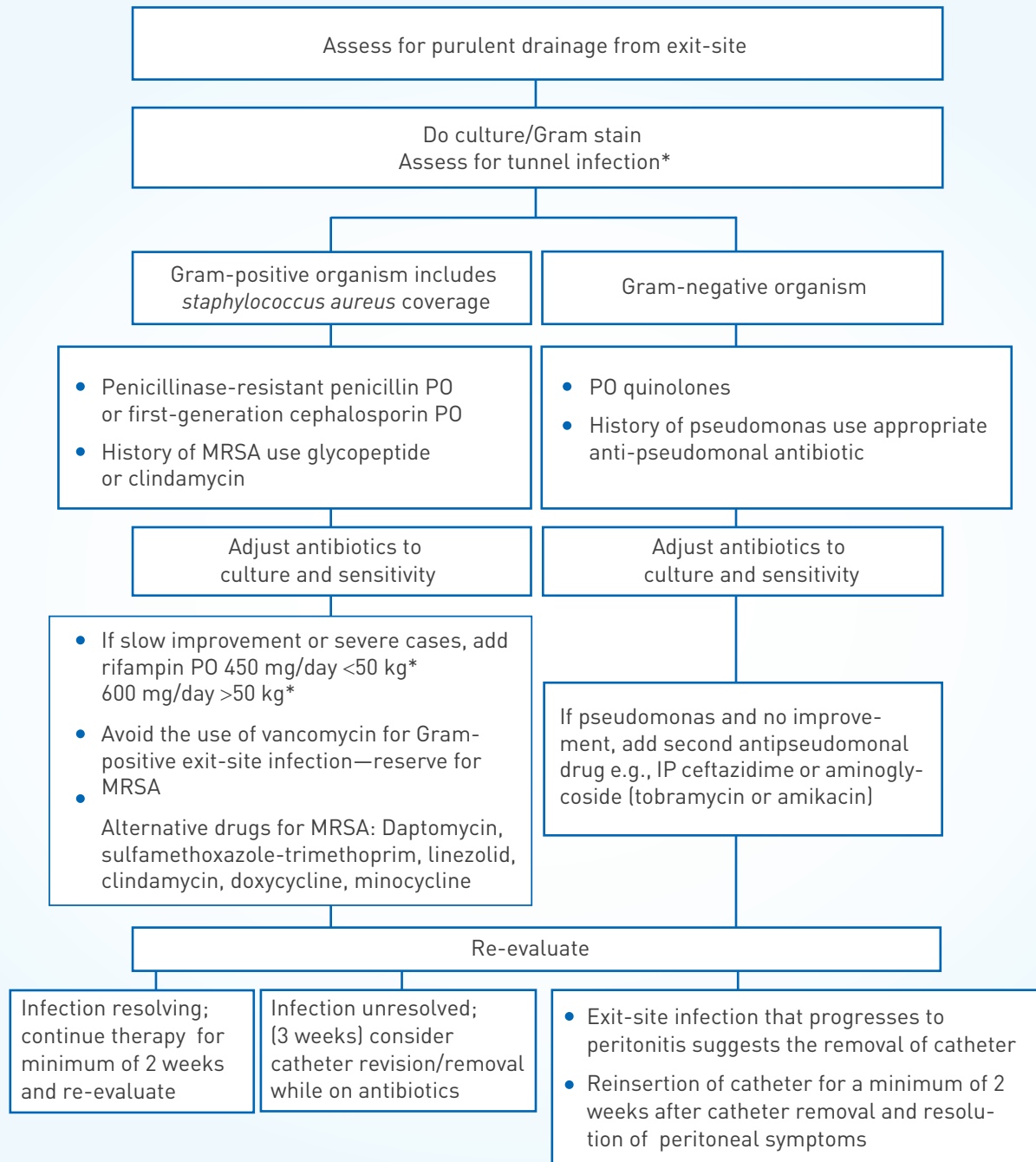
The 2017 ISPD guidelines recommend a standardized exit-site scoring system to judge the swelling, crust formation, redness, pain, and drainage of the exit-site.

Exit-site scoring system: ISPD guidelines/recommendations			
	0 Point	1 Point	2 Points
Swelling	No	<0.5 cm	>0.5 cm and/or tunnel
Crust	No	<0.5 cm	>0.5 cm
Redness	No	<0.5 cm	>0.5 cm
Pain	No	Slight	Severe
Drainage	No	Serous	Purulent

- Infection should be assumed with an exit-site score of 4 or greater. Purulent drainage, even if alone, is sufficient to indicate infection. A score of less than four may not represent infection.
- This classification and scoring systems may help the practitioner assess, describe, and classify the exit-site infection. These systems are also useful for monitoring and documentation purposes.



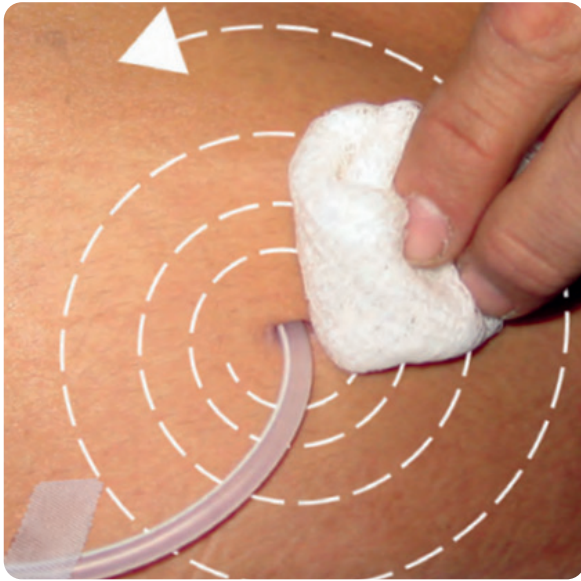
Diagnosis And Management of Exit-site/tunnel Infection



* Assess for erythema, induration, and tenderness over subcutaneous tunnel. If present, consider diagnosis of tunnel infection. Consider ultrasound of subcutaneous tunnel.¹
kg: Kilogram; MRSA: Methicillin-resistant *Staphylococcus aureus*; PO: By mouth.



Patient Education



- **Intensify exit-site care¹**
 - ♦ Clean exit-site one to two times a day.
 - ♦ Avoid toxic agents entering the sinus.
 - ♦ Change cleansing agent if required.
- **Never forcibly remove crusts and scabs.**
- **Apply new sterile dressing with each cleansing procedure until the infection resolved, even if not routinely used.**
- **Protect exit-site from exposure to organisms and trauma.**



Outcomes Evaluation

Monitor and evaluate the following at regular intervals:

- Date of culture, organism identified, drug therapy used.
- Date infection resolved.
- Recurrent organisms, date of drug therapy.
- Date of re-education/training.
- Antibiotic prophylaxis regimen used.

Adapted from: Szeto CC, *et al.* 2017

References:

1. Szeto CC, Li PK, Johnson DW, *et al.* ISPD catheter-related infection recommendations: 2017 update. *Perit Dial Int.* 2017;37(2):141–154.
2. Twardowski ZJ, Prowant BF. Classification of normal and diseased exit sites. *Perit Dial Int.* 1996;16(3):32–50.
3. Prowant BF, Khanna R, Twardowski ZJ. Peritoneal catheter exit-site morphology and pathology: Prevention, diagnosis, and treatment of exit-site infections. Case reports for independent study. *Perit Dial Int.* 1996;16(3):105–114.
4. Schaefer F, Klaus G, Müller-Wiefel DE, *et al.* Intermittent versus continuous intraperitoneal glycopeptide/ceftazidime treatment in children with peritoneal dialysis-associated peritonitis. The Mid-European Pediatric Peritoneal Dialysis Study Group (MEPPS). *J Am Soc Nephrol.* 1999;10(1):136–145.