Table 2. Suggested Antibiotic Regiments for Vascular and Interventional Radiology Procedures

Procedure	Class of Recommendation	Level of Evidence	Potential Organisms Encountered	Procedure Classification	Routine Prophylaxis Recommended*	First-Choice Antibiotic	Suggested Antibiotic Regimens	Other Antibiotic Regimens	Comments*
Diagnostic angiography and angioplasty	III	B-NR	*Staphylococcus aureus, Staphylococcus epidermis*	Clean	No	None	NA	NA	Special considerations: 1–2 g cefazolin IV in high-risk patients; vancomycin recommended in penicillin-allergic patients
Intravascular placement of bare metal stent	III	C-LD	*S. aureus, S. epidermis*	Clean	No	None	NA	NA	Special considerations: 1–2 g cefazolin IV in high-risk patients; vancomycin recommended in penicillin-allergic patients
Arterial endografts	IIb	B-NR	*S. aureus, S. epidermis*	Clean	Yes	1–2 g cefazolin IV	NA	NA	Vancomycin recommended in penicillin-allergic patients
AV fistula and graft angioplasty, stent placement, thrombectomy. and coil embolization	IIb	C-LD, C-EO	*S. aureus, S. epidermis*	Clean	No	None	NA	NA	Special considerations: 1–2 g cefazolin IV in high-risk patients, especially those receiving covered stent; vancomycin recommended in penicillin-allergic patients
Closure devices	III	B-NR	*S. aureus, S. epidermis*	Clean	No	None	NA	NA	Special considerations: 1–2 g cefazolin IV in high-risk patients; vancomycin recommended in penicillin-allergic patients
Uterine artery embolization	IIa	C-EO	*S. aureus, S. epidermis, Streptococcus* spp., *Escherichia coli,* vaginal flora	Clean, clean contaminated	Yes	No consensus	1–2 g cefazolin IV	(i) 900 mg clindamycin IV + 1.5 mg/kg gentamicin; (ii) 2 g ampicillin IV; (iii) 1.5–3 g ampicillin/sulbactam IV; (iv) 100 mg doxycycline twice daily for 7 d (in women with hydrosalpinx)	Vancomycin recommended in penicillin-allergic patients
Hepatic embolization and chemoembolization	IIb	B-NR, C-LD	*S. aureus, S. epidermidis,* enteric flora: anaerobes, eg, *Bacteroides* spp., *Enterococcus* spp., *Enterobacteriaceae* spp. (*E. coli, Klebsiella* spp., *Lactobacillus* spp.), *Candida* spp.	Clean, clean contaminated (if history of biliary colonization)	Yes	No consensus	With competent sphincter of Oddi: (i) 1.5–3 g ampicillin/sulbactam IV (hepatic chemoembolization); (ii) 1 g cefazolin + 500 mg metronidazole IV (hepatic chemoembolization); (iii) 2 g ampicillin IV + 1.5 mg/kg gentamicin (hepatic chemoembolization);	With incompetent sphincter of Oddi: oral moxifloxacin 400 mg/d beginning 3 d before and continuing for 17 d postprocedure, (ii) levofloxacin 500 mg/d + metronidazole 500 mg twice daily beginning 2 wk after chemoembolization with bowel	Vancomycin or clindamycin/gentamycin recommended in penicillin-allergic patients

continued

Table 2. Suggested Antibiotic Regiments for Vascular and Interventional Radiology Procedures *(continued)*

Procedure	Class of Recommendation	Level of Evidence	Potential Organisms Encountered	Procedure Classification	Routine Prophylaxis Recommended*	First-Choice Antibiotic	Suggested Antibiotic Regimens	Other Antibiotic Regimens	Comments*
							(iv) 1 g ceftriaxone IV (hepatic chemoembolization or renal, splenic embolization)	preparation of neomycin 1 g + erythromycin base 1 g orally at 1, 2, and 11 PM the day before chemoembolization and 1 g ceftriaxone IV preprocedure; (iii) 1.5–3 g ampicillin sulbactam IV; (iv) 1–2 g cefazolin IV with 500 mg metronidazole IV preprocedure followed by amoxicillin/clavulanic acid for 5 d postdischarge	
Radioembolization	IIb	C-LD	*S. aureus*, *S. epidermidis*, enteric flora: anaerobes, eg, *Bacteroides* spp., *Enterococcus* spp., *Enterobacteriaceae* spp. (*E. coli*, *Klebsiella* spp., *Lactobacillus* spp.), *Candida* spp.	Clean, clean contaminated (if history of biliary colonization)	No consensus	No consensus	With competent sphincter of Oddi: none	When infusing proximal to cystic artery: ciprofloxacin 500 mg twice per day for 5 d; with incompetent sphincter of Oddi, (i) oral moxifloxacin 400 mg/d beginning 2 d before radioembolization and continued for 10 d after, (ii) oral moxifloxacin 400 mg started 3 d before radioembolization and continued for 18 d after	Amoxicillin/clavulanic acid 875 mg twice daily for similar duration if allergic to moxifloxacin
Gastrointestinal embolization	IIb	C-LD, C-EO	*Streptococcus*, *Staphylococcus*; if evidence of hemobilia: enteric organisms, eg, *E. coli*, *Enterococcus* spp., anaerobes	Clean, clean contaminated (if history of biliary colonization)	Not in average-risk patients; antibiotics recommended for patients with hemobilia	No consensus	(i) 1 g ceftriaxone IV; (ii) 1.5–3g ampicillin/sulbactam IV; (iii) 1 g cefotetan IV + 4 g mezlocillin IV; (iv) 2 g ampicillin IV + 1.5 mg/kg gentamicin IV; (v) if penicillin-allergic, can use vancomycin or clindamycin and aminoglycoside	NA	NA
Partial splenic embolization for hypersplenism	IIb	C-LD, C-EO	*Streptococcus*, *Staphylococcus*	Clean	Antibiotics recommended if > 70% of spleen is expected to be embolized	No consensus	(i) Gentamicin 10 mg/kg/d, cefoxitin sodium 100 mg/kg/d beginning 2 h before and continuing for ≥ 5 d after; soaking of embolic spheres with 1,000,000 U penicillin and 40 mg gentamicin also recommended; (ii) 1 g	NA	NA

continued

Table 2. Suggested Antibiotic Regiments for Vascular and Interventional Radiology Procedures *(continued)*

Procedure	Class of Recommendation	Level of Evidence	Potential Organisms Encountered	Procedure Classification	Routine Prophylaxis Recommended*	First-Choice Antibiotic	Suggested Antibiotic Regimens	Other Antibiotic Regimens	Comments*
							cefoperazone every 12 h postprocedure for ≥ 5 d following; (iii) embolic particles suspended in gentamicin (16 mg) in combination with 5-d course of IV amoxicillin/clavulanate (3 g/d) and ofloxacin (400 mg/d)		
Totally implanted central venous access ports	IIb	B-R, C-EO	*S. aureus*, *S. epidermidis*	Clean	No	No consensus	1–2 g cefazolin IV	NA	Vancomycin recommended in penicillin-allergic patients
Tunneled dialysis catheters	IIb	B-R, C-EO	*S. aureus*, *S. epidermidis*	Clean	Yes	No consensus	1–2 g cefazolin IV	NA	Vancomycin recommended in penicillin-allergic patients
Other central venous access catheters, including nontunneled hemodialysis catheters	IIb	C-LD, C-EO	*S. aureus*, *S. epidermidis*	Clean	No, except in high-risk patients, including immunocompromise	No consensus	1–2 g cefazolin IV	NA	Vancomycin recommended in penicillin-allergic patients
Lower-extremity superficial venous insufficiency treatment	III	C-LD, C-EO	*S. aureus*, *S. epidermidis*	Clean	No	None	NA	NA	NA
IVC filter placement	III	C-LD, C-EO	*S. aureus*, *S. epidermidis*	Clean	No	None	NA	NA	NA
IVC filter retrieval	IIb	C-EO	*S. aureus*, *S. epidermidis*, possibly polymicrobial colonic flora including anaerobes	Clean, clean contaminated	No except in cases of embedded IVC filters with known bowel penetration	No consensus	NA	NA	Special considerations: (i) piperacillin/tazobactam or (ii) ampicillin/sulbactam may be considered for prophylaxis for retrieval of embedded IVC filters with known bowel penetration
Thrombolysis	IIa	C-EO	*S. aureus*, *S. epidermis*	Clean	No	None	NA	NA	Special considerations: 1–2 g cefazolin IV in high-risk patients; Vancomycin recommended in penicillin-allergic patients
Vascular malformation	IIb	C-EO	*S. aureus*, *S. epidermis*	Clean, contaminated	Yes	None	(i) 1–2 g cefazolin for adults, (ii) cefazolin 25 mg/kg for pediatric patients, (iii) clindamycin 10 mg/kg for oral lesions	NA	Recommendations primarily for percutaneous sclerotherapy/ablation of slow flow venous or

continued

Table 2. Suggested Antibiotic Regiments for Vascular and Interventional Radiology Procedures *(continued)*

Procedure	Class of Recommendation	Level of Evidence	Potential Organisms Encountered	Procedure Classification	Routine Prophylaxis Recommended*	First-Choice Antibiotic	Suggested Antibiotic Regimens	Other Antibiotic Regimens	Comments*
									venolymphatic malformations.
Varicocele embolization (transcatheter)	III	C-EO	*S. aureus*, *S. epidermis*	Clean	No	None	None	NA	–
TIPS	IIb	C-LD, C-EO	*S. aureus*, *Enterococcus faecalis*, *E. coli*, *Klebsiella* spp., *Lactobacillus acidophilus*, *Gemella morbillorum*, *Acinetobacter* spp., *Streptococcus sanguinis*, *Streptococcus gallolyticus*, and *Candida albicans*	Clean, clean contaminated	Yes	No consensus	(i) 1 g ceftriaxone IV; (ii) 1.5–3 g ampicillin/sulbactam	NA	Vancomycin or clindamycin/gentamycin recommended for penicillin-allergic patients
Percutaneous transhepatic biliary drain and cholecystostomy	IIb	C-LD, C-EO	*Enterococcus* spp., *Candida* spp., Gram-negative aerobic bacilli, *Streptococcus viridans*, *E. coli*, and *Clostridium* spp.; *Klebsiella*, *Pseudomonas*, and *Bacteroides* spp., particularly in cases of advanced biliary disease, including hepatolithiasis	Contaminated, dirty	Yes for new placement and routine exchanges	No consensus	(i) 1 g ceftriaxone IV; (ii) 1.5–3 g ampicillin/sulbactam IV; (iii) 1 g cefotetan IV plus 4 g mezlocillin IV; (iv) 2 g ampicillin IV plus 1.5 mg/kg gentamicin IV	NA	Vancomycin or clindamycin-gentamycin recommended for penicillin-allergic patients
Percutaneous nephrostomy tubes	IIb	C-LD, C-EO	*E. coli*, *Proteus*, *Klebsiella*, and *Enterococcus* spp.	Clean contaminated, contaminated, or dirty	Yes except in routine catheter exchange for low-risk patients	No consensus	(i) 1–2 g ceftriaxone IV single dose; (ii) 1.5–3 g ampicillin/sulbactam IV every 6 h + 5 mg/kg gentamycin IV single dose	NA	Patients with indwelling ureteral catheters, ureteroileal anastomosis should be considered high-risk; vancomycin recommended in penicillin-allergic patients
Gastrostomy tube placement	IIb	B-NR, C-LD	Push type, *S. aureus*, *S. epidermis*, pull type, *S. aureus*, *S. epidermidis*, and oropharyngeal flora (eg, *S. viridans* (α-hemolytic), *Lactobacillus* spp., non-diphtheroid *Corynebacterium* spp., anaerobes *Bacteroides* spp., *Actinobacillus* spp.)	Clean contaminated	Yes for push and pull type	Push type, cefazolin single dose; pull type, cefazolin/cefalexin for 6 d	Push type, 1–2 g cefazolin or clindamycin (if penicillin-allergic); pull type, (i) 1–2 g cefazolin preprocedure followed by 500 mg cephalexin oral/gastrostomy-inserted twice daily for 5 d; (ii) 600 mg clindamycin IV at time of procedure followed by 600 mg oral clindamycin twice daily for 5 d	NA	Special consideration: 1–2 g cefazolin IV pre-procedure for push-type gastrostomies in patients with head and neck cancer; Vancomycin or clindamycin-gentamycin is recommended for penicillin-allergic patients

continued

Table 2. Suggested Antibiotic Regiments for Vascular and Interventional Radiology Procedures *(continued)*

Procedure	Class of Recommendation	Level of Evidence	Potential Organisms Encountered	Procedure Classification	Routine Prophylaxis Recommended*	First-Choice Antibiotic	Suggested Antibiotic Regimens	Other Antibiotic Regimens	Comments*
Liver tumor ablation	IIb	C-LD, C-EO	*S. aureus*, *S. epidermidis*, *E. coli*, *Clostridium perfringens*, *Enterococcus* spp.	Clean contaminated, contaminated if sphincter of Oddi dysfunction	Yes, especially in high-risk patients (eg history of biliary–enteric anastomosis, cirrhosis, diabetes)	No consensus	In low-risk patients, 1–2 g cefazolin IV	In high risk patients, (i) oral levofloxacin 500 mg/d + oral metronidazole 500 mg twice daily beginning 2 d before and continuing for 14 d after ablation + neomycin 1 g and erythromycin base 1 g orally at 1, 2, and 11 PM on the day before ablation; (ii) 1.5 g ampicillin/sulbactam IV; (iii) vancomycin or clindamycin can be given for Gram-positive coverage and gentamicin for Gram-negative coverage	NA
Renal tumor ablation	IIb	C-LD, C-EO	*E. coli*, *Proteus*, *Klebsiella* spp.	Clean contaminated, contaminated if urothelial colonization	No, except in patients with colonized urothelium	No consensus	1 g ceftriaxone IV		Clindamycin/gentamycin recommended for penicillin-allergic patients
Other tumor ablation (lung, adrenal, bone)	IIb	C-EO	Skin and respiratory flora	Clean, clean contaminated (lung)	No consensus	No consensus	1–2 g cefazolin IV	NA	Special consideration: for patients with single lung, ablation/amoxicillin clavulanate 2 g or ofloxacin 400 mg/d continued for 3–7 d postablation
Percutaneous abscess drainage	IIb	C-EO	Polymicrobial	Dirty	Yes if not already on antibiotics	Location of abscess influences organisms encountered	Single-agent regimens for intraabdominal infections: meropenem, imipenem/cilastatin, doripenem, piperacillin/tazobactam	Metronidazole in combination with ciprofloxacin, levofloxacin, ceftazidime, ampicillin, sulbactam, or cefepime	Antibiotics should cover anticipated organisms for empiric treatment and then be adjusted for final culture results
Paracentesis and thoracentesis	IIb	C-EO	*S. aureus*, *S. epidermidis*, *S. viridans*	Clean	No	NA	NA	NA	Special considerations: 1–2 g cefazolin IV can be considered for tunneled pleural or peritoneal catheters; vancomycin can be considered in patients with penicillin allergy
Percutaneous biopsy	I	B-R, B-LD	Transrectal Gram-negative bacteria *Enterococcus* spp., *E. coli*, *Bacteroides* spp., other anaerobes	Clean, transrectal biopsies, contaminated	No, except for transrectal prostate biopsy	No consensus	For transrectal prostate biopsy: (i) 500 mg ciprofloxacin + 1.5 mg/kg gentamycin	(i) 1 g ceftriaxone + 1.5 g/kg gentamycin, (ii) 160 mg trimethoprim/800 mg sulfamethoxazole orally as single dose 1 h before biopsy	NA
	IIb	C-EO	*S. aureus*, *S. epidermis*	Clean	Yes		NA	NA	

continued

Table 2. Suggested Antibiotic Regiments for Vascular and Interventional Radiology Procedures *(continued)*

Procedure	Class of Recommendation	Level of Evidence	Potential Organisms Encountered	Procedure Classification	Routine Prophylaxis Recommended*	First-Choice Antibiotic	Suggested Antibiotic Regimens	Other Antibiotic Regimens	Comments*
Percutaneous vertebral body augmentation						1–2 g cefazolin IV			Vancomycin recommended in penicillin-allergic patients
Salivary gland Botox injections	IIb	C-LD, C-EO	*S. aureus, S. epidermis*	Clean	No	NA	NA	NA	NA
Percutaneous cecostomy insertion	IIa	C-LD, C-EO	Polymicrobial-including anaerobes from colonic flora, *S. aureus, S. epidermidis*	Clean contaminated	Yes	No consensus	(i) Cefoxitin 30 mg/kg single prophylactic dose; addition of triple antibiotic regimen only in complicated insertions using gentamycin 2.5 mg/kg IV, metronidazole 10 mg/kg IV, and ampicillin 20 mg/kg IV administered before and for 2 d after procedure with continuation of metronidazole 10 mg/kg orally for total of 5 d; (ii) prophylactic gentamycin 2.5 mg/kg IV, metronidazole 10 mg/kg IV, and ampicillin 20 mg/kg IV administered before and for 2 d after procedure with continuation of metronidazole 10 mg/kg orally for total of 5 d; (iii) prophylactic gentamycin 2.5 mg/kg IV and metronidazole 10 mg/kg IV before and 2 d after procedure	NA	NA
Bone interventions (osteoid osteoma ablation, sclerotherapy)	IIb	C-LD, C-EO	*S. aureus, S. epidermis*	Clean	No	NA	NA	NA	NA

AV = arteriovenous; EO = expert opinion; IV = intravenous; IVC = inferior vena cava; LD = limited data; NA = not applicable; NR = nonrandomized; TIPS = transjugular intrahepatic portosystemic shunt.

*When routine antibiotic prophylaxis is recommend or suggested, please see **Appendix C** for pediatric dosing recommendations.