

Methicillin-resistant *Staphylococcus aureus* isolated from dogs treated at the Kansas State University Veterinary Health Center



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Introduction

- Methicillin-resistant *Staphylococcus aureus* (MRSA) are bacteria of public health significance.
- MRSA colonization in dogs is typically transient, but MRSA can cause skin and soft tissue infections in pets, as in people.
- Most cases of MRSA in dogs are believed to originate from close contact with an infected or colonized person; however, transmission can be from human-to-pet or from pet-to-human.¹
- Because of resistance to Beta-lactams and often other antimicrobials, treatment of MRSA infections can be challenging.

Objectives

To summarize frequency, specimen, hospital service, and susceptibility of MRSA isolated from canine patients at the KSU Veterinary Health Center (VHC).

Materials and Methods

- Kansas State Veterinary Diagnostic Laboratory (KSVDL) culture and susceptibility reports from 2016-2020 were reviewed for canine VHC patients with MRSA isolates, as identified by oxacillin resistance.
- Data recorded included specimen/infection site, hospital service, and susceptibility pattern.
- Only the first MRSA isolate per patient was included.
- An antibiogram was created to summarize susceptibility.

Figure 1. Total number of canine patients from the KSU Veterinary Health Center with MRSA isolated per year from 2016-2020.

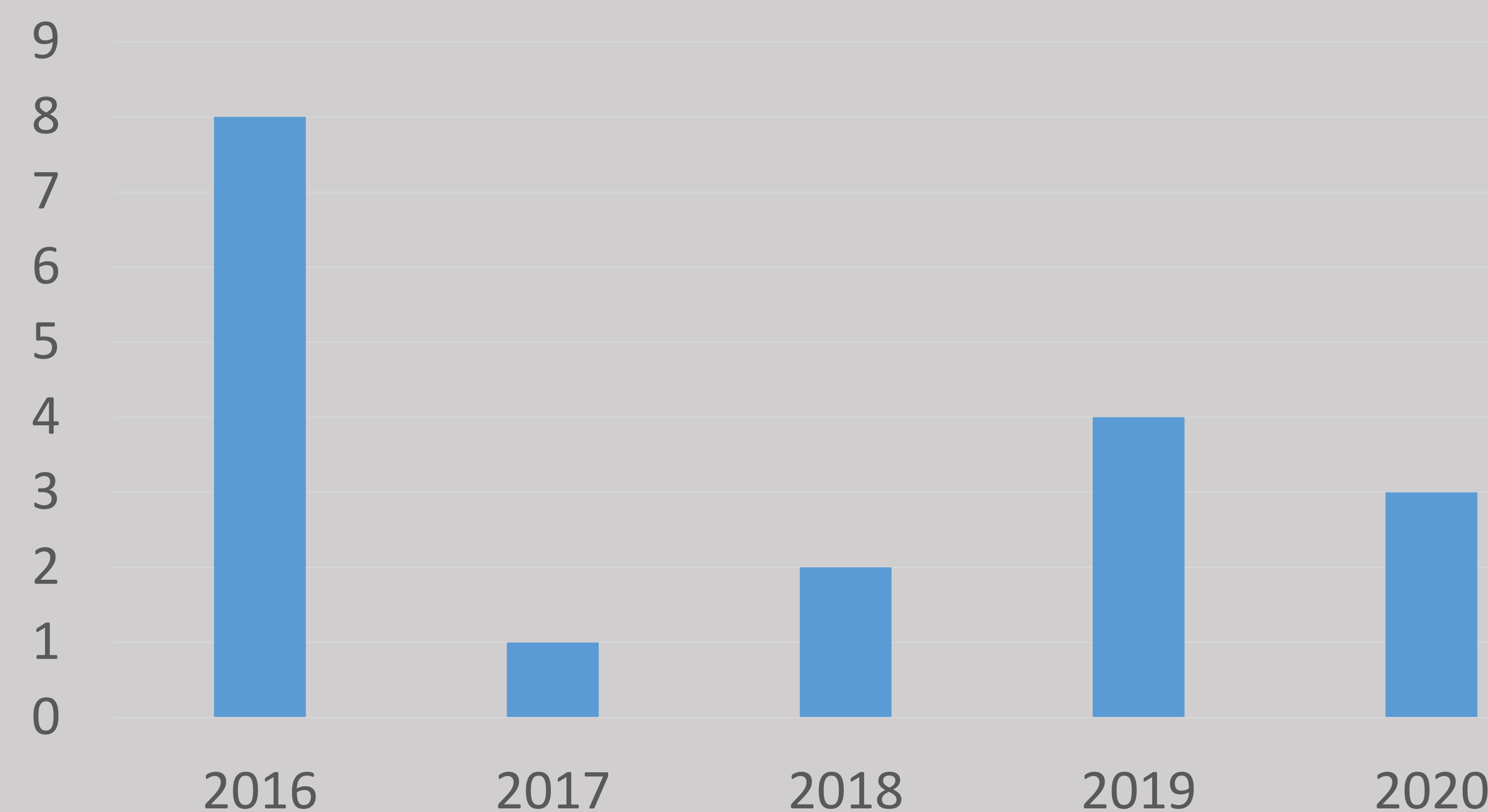
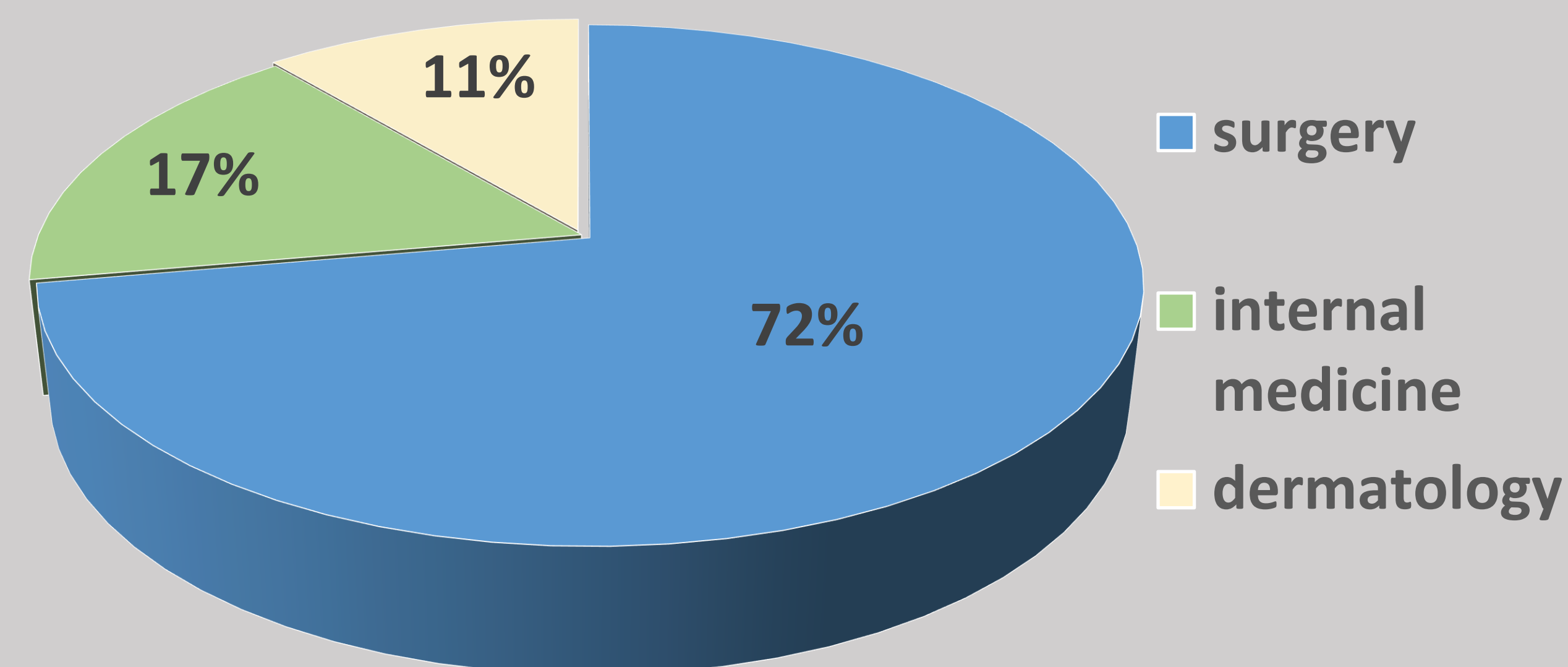


Figure 2. Percent of MRSA canine cases (N=18) coming from different specialty services within the KSU Veterinary Health Center.



Results and Discussion

- Clinical canine MRSA infections were rare, with 18 dogs (and 3 cats) having MRSA isolated during this time, with no specific trend over the years. (Figure 1)
- Most cases were seen through the surgery service. (Figure 2). Infected orthopedic implants (N=8) were most common, followed by wounds (N=7), pyoderma (N=2), and urinary tract infection (N=1).
- Although MRSA infections can be complicated to manage, local canine MRSA infections retain good susceptibility to chloramphenicol, gentamicin, minocycline, rifampin, sulfa, and vancomycin. (Table 1)
- Vancomycin remains a drug of last resort in veterinary medicine and was not prescribed for any of these canine patients.
- MRSA lesions in dogs (as in people) should be kept bandaged when possible and good hand hygiene practiced routinely to minimize transmission.

References

1. Weese JS. *ILAR Journal* 2010;51:233-244.
2. CLSI supplement VET08 (ISBN 978-1-68440-010-2 [Print]; ISBN 978-1-68440-011-9 [Electronic]). Clinical and Laboratory Standards Institute, 950 West Valley Road, Suite 2500, Wayne, Pennsylvania 19087 USA; 2018.

Acknowledgements

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Table 1. Antibiogram of canine MRSA isolates (N=18) including Clinical Laboratory and Standards Institute (CLSI) breakpoints² and number (#) and percent (%) of canine MRSA isolates susceptible to each antimicrobial. CLSI breakpoints were as specific as possible: *for canine *Staphylococcus* spp, ^for canine *Staphylococcus pseudintermedius*, †for human *Staphylococcus* spp, ‡for human *Staphylococcus aureus*

Drug	Chloramphenicol ♦	Clindamycin *	Doxycycline ^	Enrofloxacin *	Erythromycin ♦	Gentamicin ♦	Marbofloxacin *	Minocycline ^	Pradofloxacin ^	Rifampin ♦	Tetracycline *	Trimethoprim -sulfa ♦	Vancomycin †
Breakpoint	S≤8	S≤0.5	S≤0.12	S≤0.5	S≤0.5	S≤4	S≤1	S≤0.5	S≤0.25	S≤1	S≤0.25	S≤2	S≤2
# susceptible	18	11	12	9	6	18	9	18	9	18	15	18	18
% susceptible	100%	61%	67%	50%	33%	100%	50%	100%	50%	100%	83%	100%	100%