**Antimicrobial Stewardship Program Template for Companion Animal Veterinary Practices**

# Purpose

Antimicrobial stewardship (AMS) is a commitment to optimize antibiotic use. Veterinary practices should establish and maintain an AMS Program to prescribe antimicrobials judiciously, prevent the spread of antibiotic resistant organisms, and promote better outcomes for patients and clients. The overall purpose of this template is to provide veterinary practices with guidance and tools for a framework to implement a feasible program. This template will guide you in developing an AMS program and help you think creatively about methods to raise awareness of AMS among your colleagues, clients, and community. AMS is a team effort requiring dedication from all staff members. It is meant to be continuously improved as companion animal veterinary practices take more and more steps forward, science advances, and best practices become evident.

# Instructions

This template reflects a sample AMS Program plan for companion animal veterinary practices in Iowa. It is meant to be customized! Add, delete, and edit the content to fit your practice’s unique needs. Specific areas to be filled in are shown in brackets with teal highlights such as “[INSERT]”. Appendices referenced as suggested resources can be found at the end of this document, and should be copied, pasted into a new document, and customized as needed.

# Helpful Resources

Additional resources (including an instructional guide and team meeting slide deck) are available at [Iowa Department of Health and Human Services: Antimicrobial Resistance](https://hhs.iowa.gov/center-acute-disease-epidemiology/hai-prevention/antimicrobial-resistance). A list of selected references used to compile these resources is found in Appendix A.

# Acknowledgments

This template and associated materials were created by the Center for Food Security and Public Health, Iowa Department of Agriculture and Land Stewardship, and Iowa Department of Health and Human Services in partnership with expertise provided by Iowa State University College of Veterinary Medicine and Minnesota’s One Health Antibiotic Stewardship Collaborative.

Special thanks to the following organizations for their educational resources and commitment to AMS:

* American Veterinary Medical Association
* Iowa Healthcare Collaborative
* Iowa Hospital Association
* Iowa Pharmacy Association
* University of Melbourne

It is important to keep in mind that although these suggested measures are guided by science, some are based on clinical and epidemiologic studies among human patients and have not been validated by research to reduce the spread of antimicrobial resistance in companion animal veterinary practices.

**Please remove this page when you are done customizing the template.**

# Our Antimicrobial Stewardship Program

[INSERT NAME OF PRACTICE]

[INSERT ADDRESS]

[INSERT NAME OF AMS CHAMPION(S)]

[INSERT CONTACT INFORMATION FOR AMS CHAMPION(S)]

[INSERT DATE OF CREATION]

[INSERT DATE REVISED BY]

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# Mission Statement

Our practice recognizes that antimicrobial resistance (AMR) is a significant and growing concern around the world, requiring creative solutions from all stakeholders. We have written this Antimicrobial Stewardship (AMS) Program to continuously improve our judicious use of antimicrobials. Our goal is to improve prescribing, prevent the spread of antibiotic resistant organisms, and promote better outcomes for patients. The guiding principles of our AMS Program include:

1. Publicly commit to the establishment and maintenance of this AMS Program
2. Advocate for strong preventive health care as well as infection control and biosecurity practices that prevent common diseases
3. Use antimicrobials sparingly and select them judiciously
4. Continuously evaluate and revise our antimicrobial use practices
5. Build AMS expertise within our practice, thereby enhancing knowledge across our community and state as well

# Team Member Responsibilities

**AMS Champion duties:**

* Draft a written AMS Program
* Facilitate decision-making by leadership and other team members
* Review and update the AMS Program on an annual basis, or more frequently as needed
* [INSERT OTHER RELEVANT DUTIES AS NEEDED]

**Assistant AMS Champion duties:**

* Review and provide feedback on the written AMS Program
* Assist the AMS Champion with implementing Program activities as needed
* [INSERT OTHER RELEVANT DUTIES AS NEEDED]

**Practice Manager duties:**

* Support the AMS Champion with scheduling team meetings and other administrative tasks
* Assist the AMS Champion with understanding data and providing reports when requested
* Cultivate a workplace culture of continuous improvement towards AMS
* [INSERT OTHER RELEVANT DUTIES AS NEEDED]

**Veterinarian duties:**

* Utilize best practices and guidelines, when available, for the treatment of common conditions requiring antimicrobials, including the right medication at the right dose for the right duration
* Promote preventive medicine strategies and use of non-antimicrobial therapies (e.g., special diet for diarrhea)
* Cultivate a workplace culture of continuous improvement towards AMS
* Educate pet owners on the importance of AMS and how to properly medicate animals and dispose of medications that are no longer needed
* Commit to continuing education on treatment of common conditions requiring antimicrobials
* [INSERT OTHER RELEVANT DUTIES AS NEEDED]

**Veterinary Technician duties:**

* Commit to learning more about AMS in the workplace and continuing education opportunities
* Assist veterinarians with judiciously selecting and prescribing antimicrobials
* Work with clients to find creative solutions for each patient’s unique needs
* [INSERT OTHER RELEVANT DUTIES AS NEEDED]

[INSERT OTHER POSITIONS AND DUTIES AS NEEDED]

# 1. Commit to AMS

We have publicly committed to AMS with the following activities:

[MODIFY DATES AND ACTIVITIES AS NEEDED FOR EACH ROW BELOW]

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Previously completed | Target date for implementation | Postpone for later |
| Identify 1-2 AMS Champion(s) | X |  |  |
| Write an AMS Program |  | 12/31/2025 |  |
| Document commitment to AMS by each staff person |  | 12/31/2025 |  |
| Display a commitment poster for staff |  | 6/30/2026 |  |
| Develop talking points on AMS topics with staff |  | 6/30/2026 |  |
| Promote Antibiotic Awareness Week in November with staff/clients |  |  | X |
| Identify three most common conditions treated with antimicrobials in our practice to help focus AMS efforts |  |  | X |
| [INSERT ADDITIONAL ACTIVITIES OF INTEREST] |  |  |  |

## Suggested resources for implementing the above activities:

* [Appendix B: Staff Commitment Form](#_Appendix_B:_Staff)
* [Appendix C: Talking Points Worksheet](#_Appendix_C:_Talking)
* [Antibiotic Use Talking Points for Vet Clinics (MDH/UMN)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-01/Vet_Talking_Points_8Jan2020.pdf)
* [Be Antibiotics Aware Partner Toolkit (CDC)](https://www.cdc.gov/antibiotic-use/week/toolkit.html)
* [Sample Commitment Letter to Clients (MDH/UMN)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-01/AS_Commitment_Clients_8Jan2020_Final.pdf)
* [Veterinary AMS Commitment Poster Templates (MDH)](https://www.health.state.mn.us/diseases/antibioticresistance/animal/index.html#NaN)

# 2. Advocate for Preventive Health Care, Infection Control and Biosecurity

[MODIFY DATES AND ACTIVITIES AS NEEDED FOR EACH ROW BELOW]

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Previously completed | Target date for implementation | Postpone for later |
| Use signage to remind staff about hand hygiene and PPE | X |  |  |
| Develop cleaning and disinfection protocols |  | 12/31/2025 |  |
| Audit sterile technique in the surgical setting and surgical antimicrobial prophylaxis protocols |  |  | X |
| Share professional guidelines with staff on animal vaccines (e.g., AAHA and AAFP) and parasite control (e.g., CAPC) |  | 6/30/2026 |  |
| Gather client educational materials on routine parasite control, nutritional counseling, and dental health care |  |  | X |
| Develop prevention protocols for three of the most common preventable conditions in our practice (e.g., *Bordetella*) |  |  | X |
| Develop protocols for treating and containing resistant pathogens |  |  | X |
| [INSERT ADDITIONAL ACTIVITIES OF INTEREST] |  |  |  |

## Suggested resources for implementing the above activities:

* [Biosecurity for Animals and Animal Facilities (IDALS)](https://iowaagriculture.gov/animal-industry-bureau/biosecurity)
* [Infection Control and Prevention (CFSPH)](https://www.cfsph.iastate.edu/infection-control/)
* [Keep It Clean: Infection Control and Biosecurity in Veterinary Medicine (AAHA)](https://www.aaha.org/globalassets/05-pet-health-resources/virox_booklet24.pdf)
* [Your 5 moments for Hand Hygiene (MN Dept of Health)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-02/MDH_5%20moments%20for%20hand%20hygiene_8.5x11.pdf)
* Professional Guidelines
  + [Companion Animal Parasite Council (CAPC) General Guidelines for Dogs and Cats](https://capcvet.org/guidelines/general-guidelines/)
  + [2010 ACVIM Small Animal Consensus Statement on Leptospirosis: Diagnosis, Epidemiology, Treatment, and Prevention](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3040842/)
  + [2015 NASPHV Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel](http://nasphv.org/Documents/VeterinaryStandardPrecautions.pdf)
  + [2018 AAHA Infection Control, Prevention, and Biosecurity Guidelines](https://www.aaha.org/globalassets/02-guidelines/infection-control/icpb_guidelines.pdf)
  + [2018 ACVIM consensus update on Lyme borreliosis in dogs and cats](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5980284/)
  + [2019 AAHA Dental Care Guidelines for Dogs and Cats](https://www.aaha.org/aaha-guidelines/dental-care/dental-care-home/)
  + [2020 AAHA/AAFP Feline Vaccination Guidelines](https://www.aaha.org/aaha-guidelines/2020-aahaaafp-feline-vaccination-guidelines/feline-vaccination-home/)
  + [2021 AAHA Nutrition and Weight Management Guidelines](https://www.aaha.org/aaha-guidelines/2021-aaha-nutrition-and-weight-management-guidelines/home/)
  + [2022 AAFP/AAHA Antimicrobial Stewardship Guidelines](https://www.aaha.org/globalassets/02-guidelines/2022-antimicrobial/2022-aafp_aaha-antimicrobial-stewardship-guidelines.pdf)
  + [2022 AAHA Canine Vaccination Guidelines](https://www.aaha.org/aaha-guidelines/2022-aaha-canine-vaccination-guidelines/home/)

# 3. Select and Use Antimicrobials Judiciously

[MODIFY DATES AND ACTIVITIES AS NEEDED FOR EACH ROW BELOW]

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Previously completed | Target date for implementation | Postpone for later |
| Bookmark and/or print consensus guidelines (e.g., ISCAID) for three commonly encountered conditions | X |  |  |
| Bookmark and/or print local, state, and federal guidelines for the disposal of antimicrobials |  | 12/31/2025 |  |
| Compile a list of safe medication disposal locations nearby for staff and clients to easily utilize |  | 12/31/2025 |  |
| Review culture and sensitivity practices and create a decision-tree for when it should and should not be used |  |  | X |
| Inventory antimicrobials according to priority of use and use signage/color-coding (traffic stoplight) as reminders |  |  | X |
| Require documentation of indications for antimicrobials in patient records and client communications |  |  | X |
| Develop a system to incorporate “antimicrobial time out” and “delayed prescribing” into treatment regimens |  |  | X |
| Customize prescription handouts for three most common conditions treated with antimicrobials in our practice |  |  | X |
| [INSERT ADDITIONAL ACTIVITIES OF INTEREST] |  |  |  |

## Suggested resources for implementing the above activities:

* [Appendix D: Catalog of our commonly used antimicrobials](#_Appendix_D:_Catalog)
* [Appendix E: Take-Home Instructions Client Handout](#_Appendix_E:_Take-Home)
* Appendix F: How to Dispose of Unused Medicines Client Handout
* [Antimicrobial Time-Out Form Template (MDH/UMN)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-01/Antibiotic_Time_Out_8Jan2019_Final.pdf)
* [Development of a method for creating antibiograms for use in companion animal private practices (Frey and Jacob, 2020)](https://doi.org/10.2460/javma.257.9.950)
* [Drug Disposal Locator Tool (Safe Pharmacy)](https://safe.pharmacy/drug-disposal/)
* [Guidelines for the clinical use of antimicrobial agents in the treatment of dogs and cats (NZVA)](https://www.amrvetcollective.com/assets/guidelines/guide_comp.pdf)
* [How to Practice Antimicrobial Stewardship (AAHA)](https://www.aaha.org/aaha-guidelines/2022-aafpaaha-antimicrobial-stewardship-guidelines/how-to-practice-antimicrobial-stewardship/)
* [How to Use a Clinical Antibiogram (MDH/UMN)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-02/How_to_Use_a_Clinical_Antibiogram_26Feb2020_Final.pdf)
* [ISCAID Guidelines and Consensus Statements](https://www.iscaid.org/guidelines)
* [Medication Disposal (Iowa Pharmacy Association)](https://www.iarx.org/med-disposal#:~:text=Community%20Level,no%20charge%20to%20the%20patient.)
* [Understanding Susceptibility Test Data as a Component of AMS in Veterinary Settings (CLSI)](https://clsi.org/standards/products/veterinary-medicine/documents/vet09/)
* [What Veterinarians Need to Know about AMS Testing (AVMA)](https://www.avma.org/sites/default/files/2023-12/aph-ast-one-pagers-general-2023.pdf)
* [Where and How to Dispose of Unused Medicines (U.S. Food and Drug Administration)](https://www.fda.gov/consumers/consumer-updates/where-and-how-dispose-unused-medicines)
* [2022 AAFP/AAHA Antimicrobial Stewardship Guidelines](https://www.aaha.org/globalassets/02-guidelines/2022-antimicrobial/2022-aafp_aaha-antimicrobial-stewardship-guidelines.pdf)

# 4. Evaluate Antimicrobial Use Practices

[MODIFY DATES AND ACTIVITIES AS NEEDED FOR EACH ROW BELOW]

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Previously completed | Target date for implementation | Postpone for later |
| Compare our antimicrobial inventory and prescribing practices to published consensus guidelines for our three most common conditions identified |  | 6/30/2026 |  |
| Compare our preventive health care, infection prevention/control, and biosecurity practices (e.g., vaccination and parasite control protocols) to published consensus guidelines and best practices, when available |  | 6/30/2026 |  |
| Develop a feasible tracking system for consistently monitoring AMS activities over time (e.g., number of antimicrobial units sold/prescribed per year) |  |  | X |
| Track and share program metrics with staff on an annual basis |  |  | X |
| [INSERT ADDITIONAL ACTIVITIES OF INTEREST] |  |  |  |

## Suggested resources for implementing the above activities:

* [Appendix G: Evaluating AMS Activities Worksheet](#_Appendix_G:_Evaluating)
* [Companion Animal Parasite Council (CAPC) General Guidelines for Dogs and Cats](https://capcvet.org/guidelines/general-guidelines/)
* [ISCAID Guidelines and Consensus Statements](https://www.iscaid.org/guidelines)
* [2022 AAFP/AAHA Antimicrobial Stewardship Guidelines](https://www.aaha.org/globalassets/02-guidelines/2022-antimicrobial/2022-aafp_aaha-antimicrobial-stewardship-guidelines.pdf)

# 5. Build Expertise

[MODIFY DATES AND ACTIVITIES AS NEEDED FOR EACH ROW BELOW]

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Previously completed | Target date for implementation | Postpone for later |
| Schedule recurring (e.g., quarterly) AMS team meeting |  | 12/31/2025 |  |
| Identify local experts available for questions/consults |  | 6/30/2026 |  |
| Track attendance of AMS lectures/conferences as well as communication skills, IPC and biosecurity training |  |  | X |
| [INSERT ADDITIONAL ACTIVITIES OF INTEREST] |  |  |  |

## Suggested resources for implementing the above activities:

* [Appendix H: Staff Member Education/Training Tracking](#_Appendix_H:_Staff)
* [Antimicrobial Resistance Learning Site (UMN)](https://amrls.umn.edu/)

[Infection Prevention Leader Program (NAVTA)](https://navta.net/infection-prevention-program/)

* [Online Education and Training (CFSPH)](https://www.cfsph.iastate.edu/courses/)
* Local experts available for questions and consultations
  + [INSERT CONTACT INFORMATION FOR LOCAL PHARMACIST]
  + [INSERT CONTACT INFORMATION FOR LOCAL INFECTION PREVENTIONIST]
  + [INSERT CONTACT INFORMATION FOR LOCAL PUBLIC HEALTH EPIDEMIOLOGIST]
  + [INSERT CONTACT INFORMATION FOR LABORATORY REPRESENTATIVE]
* State-wide experts available for questions and consultations
* Iowa Department of Agriculture and Land Stewardship (IDALS)

Katie Rumsey, DVM, MPH, DACVPM

Assistant State Veterinarian

515-725-1023 or [katie.rumsey@iowaagriculture.gov](mailto:katie.rumsey@iowaagriculture.gov)

* Iowa Department of Health and Human Services (Iowa HHS)

Andrew Hennenfent, DVM, MPH, DACVPM

Healthcare Associated Infections Program Manager

515-336-4287 or [andrew.hennenfent@idph.iowa.gov](mailto:andrew.hennenfent@idph.iowa.gov)

* Iowa State University Hixson-Lied Small Animal Hospital

Individual case management and referral options

515-294-4900

* Iowa State University Lloyd Veterinary Medical Center

Infectious Disease Control Committee

[idcc@iastate.edu](mailto:idcc@iastate.edu)

* Iowa State University Veterinary Diagnostic Laboratory

Bacteriology Section

515-290-1950

* National experts available for questions and consultations
* Minnesota One Health Antibiotic Stewardship Collaborative

Kristen Clark, DVM, MPH, DACVPM

[MOHASC](https://www.health.state.mn.us/communities/onehealthabx/index.html) Director, Minnesota Department of Health

[health.stewardship@state.mn.us](mailto:health.stewardship@state.mn.us)

* National Institute of Antimicrobial Resistance Research and Education (NIAMRRE)
  + 515-294-3352 or [info@niamrre.org](mailto:info@niamrre.org)

# Appendix A: List of Selected References

AVMA Committee on Antimicrobials. (2022). “[A call to action for veterinarians and partners in animal health to collect antimicrobial use data for the purposes of supporting medical decision-making and antimicrobial stewardship](https://doi.org/10.2460/javma.21.09.0431)”.

AVMA Task Force for Antimicrobial Stewardship in Companion Animal Practice. (2015). “[Antimicrobial stewardship in companion animal practice](https://doi.org/10.2460/javma.246.3.287)”.

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Scarborough et al. (2021). “[Pet Owners and Antibiotics: Knowledge, Opinions, Expectations, and Communication Preferences](https://doi.org/10.3390/antibiotics10111326)”.

Stein et al. (2021). “[Knowledge, attitudes and influencers of North American dog-owners surrounding antimicrobials and antimicrobial stewardship](https://doi.org/10.1111/jsap.13297)”.

Stein et al. (2022). “[Knowledge, attitudes and influencers of cat owners in North America around antimicrobials and antimicrobial stewardship](https://doi.org/10.1177/1098612X221090456)”.

Vercelli et al. (2022). “[Implications of Veterinary Medicine in the comprehension and stewardship of antimicrobial resistance phenomenon. From the origin till nowadays](https://doi.org/10.1016/j.vas.2022.100249)”.

Yudhanto, S. and Varga, C. (2023). “[Knowledge and Attitudes of Small Animal Veterinarians on Antimicrobial Use Practices Impacting the Selection of Antimicrobial Resistance in Dogs and Cats in Illinois, United States: A Spatial Epidemiological Approach](https://doi.org/10.3390/antibiotics12030542)”.

# Appendix B: Staff Commitment Form

I have read and understood the following antimicrobial stewardship (AMS) mission statement for our facility:

[EDIT THE FOLLOWING AMS MISSION STATEMENT, IF NEEDED]

*Our practice recognizes that antimicrobial resistance (AMR) is a significant and growing concern around the world, requiring creative solutions from all stakeholders. We have written this AMS Program to continuously improve our judicious use of antimicrobials. Our goal is to improve prescribing, prevent the spread of antibiotic resistant organisms, and promote better outcomes for patients.*

*The guiding principles of our AMS Program include:*

1. *Publicly commit to the establishment and maintenance of this AMS Program*
2. *Advocate for strong preventive health care, infection control, and biosecurity practices that prevent common diseases*
3. *Use antimicrobials sparingly and select them judiciously*
4. *Continuously evaluate and revise our antimicrobial use practices*
5. *Build AMS expertise within our practice, thereby enhancing knowledge across our community and state as well*

I commit to supporting the following activities to implement AMS into our facility this upcoming year:

[INSERT YOUR LIST OF IDENTIFIED ACTIVITIES WITH TARGET DATES]

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Appendix C: Talking Points Worksheet

Our practice values communication, both amongst ourselves and our clients. We understand antimicrobial stewardship (AMS) is a complex scientific subject. Developing talking points together as a team helps us all communicate key messages in plain language with a unified voice. Talking points are a set of short, simple, and easily remembered phrases that outline the key message of an idea in a conversational tone. Being prepared for difficult conversations ahead of time can save time, energy, and confusion during a busy workday with clients and their pets.

Published literature suggests that communicating AMS to clients is most effective when the conversation includes an explanation as to why antimicrobials are not needed and provides alternatives to antimicrobials as part of the treatment plan. This worksheet is meant for our team to identify topics for discussion, organize our ideas and evidence-based references, and create talking points that support our key message. A copy of this document will be shared with all staff and reviewed on an annual basis, or sooner as needed, to keep the document updated.

Some references that may be useful for the team to discuss together include:

* [Antibiotic Use Talking Points for Vet Clinics (MDH/UMN)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-01/Vet_Talking_Points_8Jan2020.pdf)
* [Antibiotics and Your Pets: What You Should Know (MN Dept of Health)](https://www.health.state.mn.us/diseases/antibioticresistance/animal/abxpetfs.pdf)
* [Communicating with clients: Using the right language to improve care (AVMA)](https://www.avma.org/resources-tools/practice-management/communicating-clients-using-right-language-improve-care)

**Step 1: Identify key messages you want to convey as you discuss AMS with your clients.**

**Step 2: For each key message identified, outline ideas and facts supporting your message.**

**Step 3: Prioritize your ideas by creating 2-5 main talking points that support your key message.**

*Add additional rows to the example in the table below to create your own team’s talking points. Common talking points to consider are included below as a starting point.*

|  |  |  |
| --- | --- | --- |
| Key Message | Ideas and Facts | Main Talking Points |
| *Your cat’s upper respiratory infection doesn’t need antibiotics.* | * *Upper respiratory infections in cats are usually caused by a herpesvirus or calicivirus.* * *Antibiotics may cause adverse effects such as appetite loss and diarrhea.* * [*2017 ISCAID Guidelines for Treatment of Respiratory Tract Disease in Dogs and Cats*](https://onlinelibrary.wiley.com/doi/10.1111/jvim.14627) * *Pets live closely with us so there is risk in sharing resistant bacteria between us and pets.* * *AMS is important in today’s world to protect our supply of effective antimicrobials.* * *Supportive care like warming food, ensuring hydration, and steam therapy can help your cat recover on its own.* * *Further treatment can be provided if their condition worsens or doesn’t improve.* | 1. *Respiratory infections like this are usually caused by a virus so antibiotics won’t help.* 2. *Instead, you can help your cat recover on its own by warming their food, making sure they’re getting enough water, and letting them sit in a steamy bathroom.* 3. *If your cat doesn’t improve within 3 or 4 days, call us so we can reassess.* |
| *Your dog does not need antibiotics for its diarrhea.* | * *Not all causes of diarrhea respond to antibiotics.* * *Metronidazole is commonly used to treat canine diarrhea, but it may not be useful for all cases of diarrhea and, like all antimicrobials, can carry risks with its use.* * *Prescribing supportive therapies, such as a bland diet, instead of antibiotics may be equally effective as antimicrobial therapies.* * *Fecal floats and cytology can be performed to diagnose parasitic infections while other diagnostic tests can be performed to assess other systemic illnesses.* * [*AVMA 2022: Pet with diarrhea? Maybe hold off on the antibiotics*](https://www.avma.org/news/pet-diarrhea-maybe-hold-antibiotics) * [Pegram 2023: Target trial emulation...](https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0291057) | 1. *Your dog’s physical examination and fecal analysis are normal.* 2. *Diarrhea in dogs can resolve on its own over time or with simple supportive measures, like the bland diet we are prescribing today.* 3. *Call us if your dog starts acting lethargic, having bloody stools, or isn’t improving so we can explore other testing or treatment options.* |
| *Dispose of antimicrobials properly to avoid environmental contamination and potential spread of antimicrobial resistance.* | * *Pet medications, just like human medications, can be brought to medication disposal sites.* * *Drop boxes/disposal sites are the best disposal option; many are nearby.* * *If disposal sites aren’t available, FDA recommends only tossing medications in the trash after 1) removing from pill containers; 2) mixing with an undesirable substance (like kitty litter or dirt); and 3) placing in a sealed bag.* * *Don’t flush medications down the toilet.* * [*Vercelli 2022: Implications of Veterinary Medicine in the comprehension and stewardship of AMR phenomenon...*](https://doi.org/10.1016/j.vas.2022.100249) | 1. *Tossing and flushing medications can be a concern for creating antibiotic resistant bacteria in our soil, water, and wildlife.* 2. *If you have leftover pet medication, please call us to discuss the best way for you to dispose of it.* |
| *Cytology and/or bacterial culture and sensitivity (C&S) should be performed to guide antimicrobial treatment in certain cases.* | * *Empiric use of antimicrobials can lead to antimicrobial resistant infections in our patients, community, and environment.* * *Certain antimicrobials are of critical importance in human medicine, so should be a last resort (e.g., vancomycin) or their use prohibited altogether in some veterinary practices (tigecycline).* * [*University of MN 2020: Handbook of AMS in Companion Animal Veterinary Settings*](https://arsi.umn.edu/sites/arsi.umn.edu/files/2020-06/Handook_Final_3June2020.pdf) | 1. *Let’s order some testing to make sure your pet is getting the right medication.* 2. *If culture isn’t an option today, we can look at a sample here for bacteria.* 3. *Sometimes we start one medication now while we wait for test results, then stop or switch medication.* |

# 

# Appendix D: Catalog of Commonly Used Antimicrobials in Small Animals

Our practice commonly stocks and prescribes the following antimicrobials. We have listed them here to guide our providers in using a tiered prescribing approach. The intent is to encourage the use of culture and susceptibility (C&S) testing and cytologic evaluations whenever possible and reduce the risk of developing resistant bacterial infections in our community’s companion animals and their family.

* The first column lists first-choice antimicrobials that should be selected for initial, empirical use (when culture and susceptibility test results are not available). First-choice antimicrobials are of least importance for human and veterinary medicine, include broad-spectrum (rather than narrow-spectrum) medications, and are represented in green, similar to “go” on a stoplight.
* The second column lists second-choice antimicrobials that should be selected after cytology or C&S test results indicate their use for bacterial infections. Second-choice antimicrobials are of moderate importance for human and veterinary medicine and represented in yellow, similar to “slow down” on a stoplight.
* The third column lists last resort antimicrobials that should be avoided as much as possible and require C&S results and/or clear documentation that the case meets certain criteria before their authorized use. Last-resort antimicrobials are of critical importance for human and veterinary medicine and represented in red, similar to “stop” on a stoplight.

[TAKE INVENTORY OF THE COMMONLY USED ANTIMICROBIALS PRESCRIBED IN YOUR PRACTICE AND COMPLETE THE FOLLOWING TABLE. COMMON EXAMPLES ARE LISTED BELOW AS A STARTING POINT.]

**Commonly used first choice, second choice, and last resort antimicrobials in small animals**

| **FIRST CHOICE**  **(for empirical use, if needed)** | **SECOND CHOICE**  **(after cytology or C&S)** | **LAST RESORT**  **(avoid if possible)** |
| --- | --- | --- |
| Amoxicillin | Azithromycin | Cefotaxime |
| Amoxicillin/Clavulanate | Cefpodoxime | Ceftazidime |
| Cephalexin | Cefovecin\* | Imipenem/Meropenem |
| Doxycycline | Clindamycin | Linezolid |
| Metronidazole | Enrofloxacin\* | Piperacillin-Tazobactam |
| Topicals (except mupirocin) | Erythromycin | Nitrofurantoin |
| Trimethoprim-sulfonamides | Mupirocin | Vancomycin |

\*These antimicrobials may be categorized differently due to geographic area, species, condition, etc.

This list has been compiled based on the following resources:

* World Health Organization (WHO): [Critically Important Antimicrobials for Human Medicine (2018)](https://www.who.int/publications/i/item/9789241515528)
* World Organisation for Animal Health (WOAH): [List of Antimicrobial Agents of Veterinary Importance (June 2021)](https://www.woah.org/app/uploads/2021/06/a-oie-list-antimicrobials-june2021.pdf)
* University of Minnesota: [Example Practice-Level Antibiotic Drug Tiers and Selection List for Companion Animals (2021)](https://arsi.umn.edu/sites/arsi.umn.edu/files/2021-02/Example_Antibiotic_Drug_Tiers_Selection_List_19Feb2021_FINAL.pdf)

# Appendix E: Take-Home Instructions Client Handout

**Take-Home Instructions**

**Thank you for trusting us with your pet’s care. Here are the main findings from our visit today:**

**Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Pet’s Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Doctor:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Signs of illness:**   Gastrointestinal: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Respiratory: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Skin: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Urinary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Laboratory tests:**  Completed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pending: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Diagnoses:**  Confirmed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Suspected: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**As we discussed together, please help your pet at home with the following treatment plan:**

**Supportive care:**  Rest: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Food: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Medications:**  Start now: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Fill later, if needed\*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**\*There are side effects and other risks with using antibiotics. Antibiotics may not help with some infections. We are here to help you know when your pet needs an antibiotic prescription filled.**

**Follow-up:**  Call or text update on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Schedule virtual or in-person recheck exam on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**\*Call immediately if:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**It has been a pleasure working with you to help your pet feel better.**

**Please contact us with any questions or concerns.**

**And remember to safely dispose of any unused medications.**

**We look forward to receiving an update from you soon. Thank you!**

[INSERT PRACTICE NAME/LOGO AND PHONE NUMBER]

# Appendix F: How to Dispose of Unused Medicine Client Handout

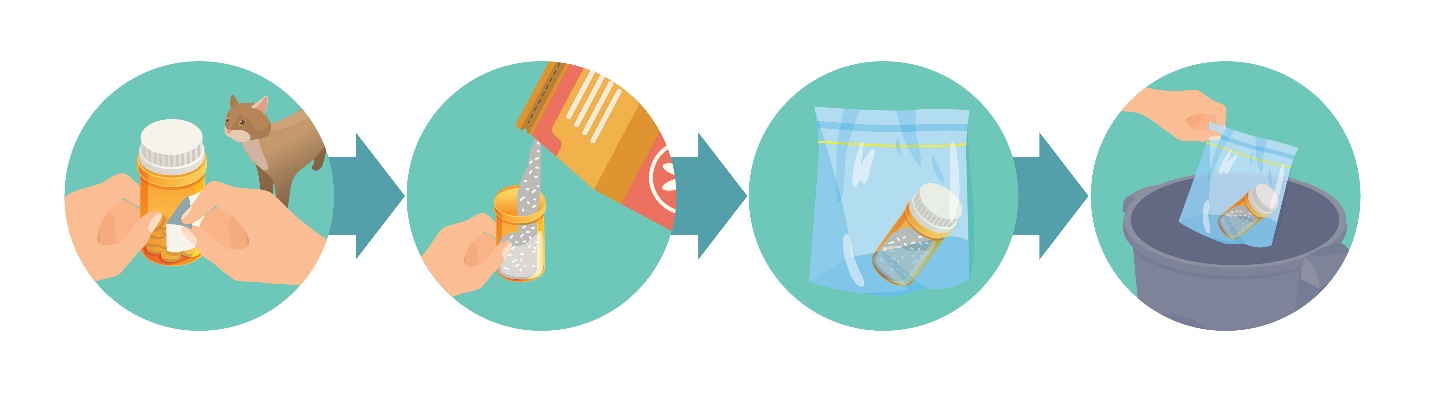
**How to Use, Store, & Dispose of Medicine Safely**

Controlled substances, like opioids, and antimicrobials, like antibiotics, can be dangerous. They can be misused by people, poison animals, and impact our natural resources, including water and wildlife. Learn how to safely store, use, and dispose of medicine to protect us all. Thank you for doing your part!



**HOME SAFETY TIPS**

* Store medications out of plain sight in the tamper resistant container they came in.
* Lock medications away to help avoid accidental exposure or unauthorized use, especially by children or other animals.
* Keep count of the medication to know if any goes missing.



**SAFE DISPOSAL OPTIONS**

**BEST –** Use all the medication as prescribed by your doctor or veterinarian.

**BETTER –** Take controlled substances and antimicrobials to a designated disposal site or drug take back event. To find a convenient location, enter your zip code at [Safe Pharmacy Drug Disposal Locator Tool](https://safe.pharmacy/drug-disposal/), and find more details about medication disposal at [Iowa Pharmacy Association](https://www.iarx.org/meddisposal).

**GOOD –** Throw your medicine in the garbage after removing personal information from the prescription label, adding kitty litter or coffee grounds (to make it undesirable), and sealing it in a leak-proof container.



If you are concerned about someone who misuses controlled substances, help is available.

If you are concerned about a family member or friend who misuses controlled substances, help is available - visit YourLifeIowa.org or call 855-581-8111 or text 855-895-8398.

· Visit [Your Life Iowa](https://yourlifeiowa.org/) · Call 855-581-8111 · Text 855-895-8398

# Appendix G: Evaluating AMS Activities Worksheet

Our practice recognizes that continuous improvement and evaluation of our antimicrobial stewardship (AMS) practices is an integral part of our AMS Program. Monitoring the effects of our AMS activities over time in a consistent way allows us to evaluate which activities to continue, discontinue, or modify. Collecting, analyzing, and interpreting antimicrobial use data is challenging for most veterinary practices. For instance, the recordkeeping systems commonly used for recording antimicrobial use are not intended for easy extraction by veterinary personnel. In the absence of standardized practices and cost-effective technological systems available for all companion animal practices, we aim to develop a practical and feasible tracking system for our practice to utilize our site-specific data.

**Step 1: Consider recordkeeping systems available and possible metrics that could be tracked.**

**Step 2: List costs and benefits for recording, extracting, analyzing, and interpreting each metric.**

**Step 3: Determine as a team which metric(s) to use in evaluating our AMS Program over time.**

Some references that may be useful for the team to discuss together include:

* [AVMA: Veterinary Checklist for Antimicrobial Stewardship](https://www.avma.org/sites/default/files/2020-06/Veterinary-Checklist-Antimicrobial-Stewardship.pdf)
* [University of Minnesota: Antibiotic Use Tracking Tool](https://arsi.umn.edu/tracking)
* [Small and Large Animal Veterinarian Perceptions of Antimicrobial Use Metrics for Hospital-Based Stewardship in the United States (Redding et al., 2020)](https://www.frontiersin.org/articles/10.3389/fvets.2020.00582/full)

*Complete the table below for the suggested metrics given. Add rows with other metrics discussed.*

|  |  |  |
| --- | --- | --- |
| Metric | Costs | Benefits |
| Number of units sold of each type of antimicrobial (e.g., Convenia) |  |  |
| Number of units sold of each non-antimicrobial therapy (e.g., probiotics, diets, pheromones) |  |  |
| Number of cultures offered |  |  |
| Number of cultures ordered |  |  |
| Number of cytological evaluations ordered |  |  |
| Number of antimicrobial resistant organisms identified by culture and susceptibility testing |  |  |
| Percentage of diagnoses (e.g., URI, UTI, acute diarrhea) that result in an antimicrobial prescription |  |  |

We have carefully considered our current resources and discussed the various metrics available to us and their potential utility in evaluating our AMS Program over time. A brief summary of each metric along with their overall costs and benefits to our practice is included in the table above. Based on our evaluation (as of [INSERT DATE]), our practice has chosen to track the following metrics over time:

* [INSERT LIST OF METRICS]

# Appendix H: Staff Member Education/Training Tracking

|  |  |  |  |
| --- | --- | --- | --- |
| Staff Member Name | Description of Education/Training | Length/CE Credit | Date(s) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |