A rabbit is presented with a severe psoroptic ear mite infestation

.

If the treatment is 300mcg/kg of a 1% Ivermectin solution SC, and the rabbit weighs 10 lbs, how many milliliters of ivermectin should be given?

0.6	HIDE
0.78	HIDE
7	HIDE
0.14	HIDE
2.8	HIDE

MERCK MANUAL Veterinary Manual

<i >Psoroptes cuniculi</i> , gross lesions, rabbit

Q 33

I kg = 2.2 lbs

10 Ib: 10/2.2=4.54 Kg

The dose of Ivermectin need to treat the Rabbit is: (as it will treat by 300mcg/kg of a 1% Ivermectine solution SC)

4.54*300=1362 **mcg**

1362/1000 000=**0.001362 gm**

1% solution means each

Each 100 ml of drug contain 1gm Ivermectin (active principle)

So 0.001362 gm need: 0.001362 *100 = 0.1362 ml ~ 0.14 ml

100 ml → **1gm**

0.001362

Correct:

The correct answer is 0.14 milliliters. *Psoroptes cuniculi* is a common ear mite in rabbits worldwide.

To determine this answer, divide the single dose by the concentration of the drug. To do this, you'll have to convert various units. To determine the single dose, first convert pound[lb]s to kilograms[kgs] by dividing lbs by 2.2. So 10lbs ÷ 2.2kg/lbs = 4.54kgs

Then, to determine micrograms[mcg], since the dose is 300 mcg per kg multiply by 300. So 4.54kgs x 300mcgs = 1362mcgs

Then to convert from mcg to milligram[mg], divide by 1000. 1362mcgs ÷ 1000mcg/mgs =1.362mg

So you'll need 1.362 mg for a single dose.

For a 1% solution, there is 1 gram in 100 milliliter[ml], to convert from g to mg, 1000mg/100ml or 10 mg/ml
Now divide the single dose by the concentration. 1.362mg ÷ 10mg/ml = 0.136mls , which rounds up to **0.14 ml**

Quick conversions:
lb ÷ 2.2kg/lbs = kgs
kg x 300 mcg/kg = mcgs
300mcg ÷ 1000mcg/mg = mgs
1000mg/100ml = 10mg/ml
mgs ÷ 10mg/ml = ml

Refs: The Merck Veterinary Manual online edition

What is the concentration of a solution containing 1 mEq/L of NaCl in mg/L if the molecular weight of sodium (Na^+) is 23g and the molecular weight of chloride (Cl^-) is 35.5g?

29.25 mg/L	HIDE
Need more information	HIDE
58.5 mg/L	HIDE
12.5 mg/L	HIDE
117 mg/L	HIDE

BACK NEXT LEAVE BLANK

The concentration of the solution is 58.5 mg/L.

Here's the calculation:

mg = (mEq x atomic weight)/valence

Atomic weight = molecular weight (MW) Na^+ + MW of Cl^- = 23g + 35.5g = 58.5g

The valence of NaCl is 1, because Na^+ is +1 and Cl^- is −1

So: mg = (1 x 58.5)/1 = 58.5

Refs: The Merck Professional Manual online edition.

A toy poodle is presented with chronic constipation.

Lactulose is prescribed for treatment at home.

If the dose is 5 cc BID, how many fluid ounces are needed for a 30 day supply?

27 ozs	HIDE
.55 ozs	HIDE
10 ozs	HIDE
300 ozs	HIDE
32 ozs	HIDE

1 cc = 0.033 OZ, Ounce, and Fl

1 cc = 1 Milliliter (ml)

BID = Twice daily

5 cc BID = 5 cc every dose in the day, so dose /day = 5*2 = **10 cc/ day**

Dose for 30 days = 30*10 = 300 cc

Convert to OZ: 1cc → 0.033 OZ

300 cc Oz

300*0.033 / 1 = 9.9 OZ (10)

Correct:

10 ozs.

To determine this answer, you need to know that BID means twice a day, and that there are 30 cubic centimeters[ccs] in one fluid ounce [oz].

First, determine how many cc's are needed, then divide that amount by 30 to convert to ozs:

To determine daily dose: 5cc x 2X per day = 10 cc a day.

Then the total ccs needed: 10 ccs x 30 days = 300 ccs total.

Then convert from ccs to ozs: 300ccs ÷ 30/1 cc/oz = 10 oz.

Then the total ccs needed: 10 ccs x 30 days = 300 ccs total.

Then convert from ccs to ozs: 300ccs ÷ 30/1 cc/oz = 10 oz.

In summary: #ccs/dose x #treatments per day = total ccs/day

#ccs/day x # days = total ccs needed

total ccs ÷ conversion rate = ozs

Lactulose is a synthetic sugar used to increase the fluid content of the colon.
Also, remember: 1 cc = 1 milliliter (ml).
Refs: The Merck Veterinary Manual online edition.

How much sterile water do you need to add to a 12 gram bottle of Superduper-cillin in order to yield a 5% solution?

60 ml	HIDE
240 ml	HIDE
480 ml	HIDE
24 ml	HIDE

BACK NEXT LEAVE BLANK

Overview | Mark this Question | Lab Values | Definitions | Report a Problem

×

Correct:

240 ml

A 5% solution contains 50 mg/ml and 12 g=12,000 mg.

If 12,000 mg/**X**ml=50mg/ml, then

X=12,000/50=240 ml

A significantly hypokalemic and dehydrated 500-kg horse needs a high level of potassium chloride (KCl) supplementation.

K^+ typically should not be administered at a rate over 0.5 mEq/kg/hr. The KCl is 2 mEq/mL. Lactated ringers solution (LRS) contains 4 mEq K^+/L.

What is the approximate maximum amount of potassium chloride (KCl) that could be added to 10 L of LRS in order to run the fluids at 4 L/h?

Need more information	HIDE
About 500 mLs	HIDE
About 10 mLs	HIDE
About 300 mLs	HIDE
About 70 mLs	HIDE

Correct:

About 300 mLs of KCl can be added to 10 L of LRS if the maximum safe dose is 0.5 mEq/kg/hr.

This is a very important calculation because potassium supplementation can be fatal if done too quickly. Hyperkalemia raises the resting membrane potential of cells, causing a hyper-excitable state. This can result in muscle and nerve excitability, which can cause cardiac arrhythmias or ARREST.

Here's the calculation:

500 kg horse x 0.5 mEq/kg/hr = 250 mEq/hr of KCl is maximum safe dose

250 mEq/hr divided by 2 mEq/mL = 125 mLs/hr of KCl

At a rate of 4 L/hr, each 4L can contain 125 mLs of KCl

10L will take 2.5 hours to administer at a rate of 4 L/hr

So, 125 mLs x 2.5 = 312.5 mLs of 2 mEq/mL KCl can be in 10 L

The 10 L LRS contains 4 mEq/L = 40 mEq total. This is negligible in the calculation for a horse but is included below to show it.

Working backwards to check your work:

10 L = 10,000 mLs

Add 300 mLs of KCl So total volume to infuse is 10300 mLs

The concentration of this solution is 640 mEq KCl ((= 300 mLs of KCl x 2 mEq/mL) +

Add 300 mLs of KCl So total volume to infuse is 10300 mLs

The concentration of this solution is 640 mEq KCl ((= 300 mLs of KCl x 2 mEq/mL) + 40 mEq in the LRS)/10300 mLs = 0.06 mEq/mL

(note: try it - if you don't include the K^+ in the LRS, you still get 0.06 mEq/mL)

0.06 mEq/mL x 4000 mLs/hr = <u>242 mEq/hr</u>...compare to first calculation: 500 kg horse x 0.5 mEq/kg/hr = <u>250 mEq/hr</u> of KCl is maximum safe dose - so pretty close!

Refs: The Merck Vet Manual online and McCurnin's Clinical Texbook for Veterinary Technicians, 8th ed.

NEB Candidate Information - NE | Google Translate | Pharmacology | Zukureview

https://zukureview.com/bcse/study-mode/pharmacology/take/60

zukureview SAVE & EXIT

PREV NEXT

11	12	13	14	15	16	17	18	19	20

How much sterile water do you need to add to a 5 gram bottle of thiopental in order to yield a 2.5% solution?

200 ml	HIDE
100 ml	HIDE
25 ml	HIDE
20 ml	HIDE

BACK NEXT LEAVE BLANK

Overview | Mark this Question | Lab Values | Definitions | Report a Problem

Calcium and Phos....ht... Show all

10:59 PM 10/27/2018

Correct:

200ml

A 2.5% solution contains 25 mg/ml and 5 g=5000 mg.

If 5000 mg/**X** ml=25mg/ml, then

X=5000/25=200 ml.

You are comparing two sets of lab results from a dog. The sodium level is in mEq/L on one and in mmol/L on the other.

What is the conversion factor to change mEq/L of sodium to mmol/L of sodium?

4	HIDE
0.25	HIDE
1	HIDE
0.5	HIDE
2	HIDE

Correct:

The conversion factor for sodium from mEq to mmol is 1. An equivalent is a unit that integrates charge and moles.

One equivalent signifies one mole of charges and can be calculated by multiplying the number of moles of charged particles in the substance by its valence (or amount of charge).

Thus, for ions with a +1 or −1 charge (e.g., Na^+, K^+, Cl^-), 1 mol = 1 equivalent (Eq) so 1 mmol = 1 mEq.

Refs: The Merck Veterinary Manual online and the Merck Professional Manual online.

Ready Reference Guides

By **Manuals Staff**

In the US, most laboratory test results are reported in what are termed conventional units; the rest of the world reports results in *Système International d'Unités* (SI) or international units (IU). The unit basis for SI is updated periodically by a panel.

Many SI units are the same as units used in the US system; however, SI units for concentrations are not. SI concentrations are reported as moles (mol) or decimal fractions of a mole (eg, millimole, micromole) per unit volume in liters (L). Conventional units are reported as mass (eg, grams, milligrams) or chemical equivalency (eg, milliequivalents) per unit volume, which may be in liters or decimal fractions of liters (eg, deciliters, milliliters). Results reported in amount per 100 mL (1 dL) are sometimes expressed as percent (eg, 10 mg/dL may be written as 10 mg%).

Moles, milligrams, and milliequivalents: A mole is an Avogadro's number (6.023×10^{23}) of elementary entities (eg, atoms, ions, molecules); the mass of 1 mole of a substance is its atomic weight in grams (eg, 1 mole of sodium = 23 g, 1 mole of calcium = 40 g). Similarly, the mass of a given quantity of substance divided by its atomic weight gives the number of moles (eg, 20 g sodium = 20/23, or 0.87, mol).

An equivalent is a unit that integrates charge and moles; 1 equivalent represents one mole of charges and is calculated by multiplying the number of moles of charged particles in a substance times the valence of that substance. Thus, for ions with a +1 or −1 charge (eg, Na^+, K^+, Cl^-), 1 mole is 1 equivalent (1 × 1 = 1); for ions with a +2 or −2 charge (eg, Ca^{2+}), ½ mole is 1 equivalent (½ × 2 = 1), and so forth for other valence values. A milliequivalent (mEq) is 1/1000 of an equivalent.

The following can be used to convert between mEq, mg, and mmol:

mEq = mg/formula wt × valence = mmol × valence

mg = mEq × formula wt /valence = mmol × formula wt

mmol = mg/formula wt = mEq/valence

(Note: Formula wt = atomic or molecular wt.)

Alternatively, conversion tables are available in print and on the Internet.

Clinical Calculator:
Weight Unit Conversions

Clinical Calculator:
Volume Unit Conversions

Clinical Calculator:
Temperature Unit Conversions

Clinical Calculator:
Flow Unit Conversions

Clinical Calculator:
Energy Unit Conversions

Clinical Calculator:
Basic Unit Conversions

Clinical Calculator:
Length Unit Conversions

Metric System

Unit	Equivalent Subunit
Mass	

1 kilogram (kg)	1000 grams (10^3 g)

Metric–Nonmetric Equivalents

Metric Unit	Equivalent Nonmetric Unit*
Liquid	
30 milliliters (mL)	1 fluid ounce (oz)

Atomic Weight of Some Elements Important in Medicine

Element	Symbol	Atomic Weight*
Hydrogen	H	1
Carbon	C	12
Nitrogen	N	14

Centigrade–Fahrenheit Equivalents*

Application	°C	°F
Freezing for water at sea level	0	32
Clinical range	36.0	96.8
	36.5	97.7

Resources In This Article

Ready Reference Guides

Ready Reference Guides

Normal Laboratory Values

Tap to switch to the Consumer Version

Also of Interest

TEST YOUR
Knowledge

Which of the following best differentiates factitious disorder imposed on self from malingering?

- Patients with factitious disorder are sophisticated regarding medical practices.
- Patients with factitious disorder complain primarily of chest pain.
- Patients with factitious disorder have no external incentives for their behavior.
- Patients with factitious disorder have numerous abdominal scars.

Am I Correct?

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Ashle

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1 2 3 4

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An African gray parrot is presented with chlamydiosis, to be treated with oral doxycycline suspension at 25 mg/kg, daily for 45 days.

If the parrot weighs 400 grams and the concentration of the drug is 50 mg/5 ml, how many milliliters are necessary for a single dose?

1.5 milliliters	HIDE
90 milliliters	HIDE
0.5 milliliters	HIDE
5 milliliters	HIDE
1 milliliter	HIDE

Correct:

1 ml

To determine the answer here, you must first find the amount of milligrams[mg] in one dose, then determine how many milliliters[ml] are required for that dose at the concentration.

Since there are 1000 g in a kg, determine the bird's weight in kg --> 400 g/1000 g = 0.4 kg

Then, to determine the amount of mg in one dose, multiply that result by 25 mg/kg --> 10 mg per dose

Then, since there is a concentration of 50 mg/5 ml, or 10 mg/ml --> one dose is 1 ml

Chlamydiosis in birds is a dangerous, zoonotic disease.

Overview of Avian Chlamydiosis

(Psittacosis, Ornithosis, Parrot fever)

By **Arnaud J. Van Wettere, DVM, MS, PhD, DACVP, Assistant Professor of Veterinary Pathology, Utah Veterinary Diagnostic Laboratory, School of Veterinary Medicine, Utah State University**

- **Avian Chlamydiosis**
- **Overview of Avian Chlamydiosis**

Avian chlamydiosis can be an inapparent subclinical infection or acute, subacute, or chronic disease of wild and domestic birds characterized by respiratory, digestive, or systemic infection. Infections occur worldwide and have been identified in at least 460 avian species, particularly caged birds (primarily psittacines), colonial nesting birds (eg, egrets, herons), ratites, raptors, and poultry. Among poultry, turkeys, ducks, and pigeons are most often affected. The disease is a significant cause of economic loss and human exposure in many parts of the world.

Etiology and Epidemiology:

Chlamydia psittaci, formerly renamed *Chlamydophila psittaci*, is an obligate intracellular bacterium. All strains of chlamydia share an identical genus-specific antigen in their lipopolysaccharide but often differ in the composition of other cell-wall antigens, thus providing a basis for serotypic identification. Eight serotypes are recognized; of these, six (A–F) infect avian species and are distinct from mammalian *Chlamydia* serotypes. More recently, strains of *C psittaci* have been classified using genetic differences in the *omp1* gene into nine genotypes. Seven of these (A, B, C, D, E, F, and E/B) are found in avian species and usually correspond to the equivalent serotype. Each avian serotype/genotype tends to be associated with certain types of birds (see Associations between Avian Genotypes of *Chlamydia psittaci* and Types of Birds). The same serotype/genotype may cause mild disease or asymptomatic infection in one species but severe or fatal disease in another species. Serotype A and D are highly virulent for turkeys and can cause mortality of ≥30%. Serotypes B and E are most frequently recovered from wild birds. Avian serotypes are capable of infecting people and other mammals.

Associations between Avian Genotypes of *Chlamydia psittaci* and Types of Birds

\+

oves

\+

++ = Genotype most commonly associated with this bird species or group.

\+ = Genotype less commonly associated with this bird species or group.

Transmission is by the fecal-oral route or by inhalation. Respiratory discharge or feces from infected birds contain elementary bodies that are resistant to drying and can remain infective for several months when protected by organic debris (eg, litter and feces). Airborne particles and dust spread the organism. After inhalation or ingestion, elementary bodies attach to mucosal epithelial cells and are internalized by endocytosis. Elementary bodies within endosomes in the cell cytoplasm inhibit phagolysosome formation and differentiate into metabolically active, noninfectious reticulate bodies that divide and multiply by binary fission, eventually forming numerous infectious, metabolically inactive elementary bodies. Newly formed elementary bodies are released from the host cell by lysis. The incubation period is typically 3–10 days but may be up to several months in older birds or after low exposure. Host and microbial factors, route and intensity of exposure, and treatment determine clinical course.

Possible sources of *C psittaci* include infected birds, asymptomatic carriers, vertical transmission from infected hens, infected mammals, and contaminated environments. Stressors (eg, transport, crowding, breeding, cold or wet weather, dietary changes, or reduced food availability) and concurrent infections, especially those causing immunosuppression, can initiate shedding in latently infected birds and cause recurrence of clinical disease. Carriers often shed the organism intermittently for extended periods. Persistence of *C psittaci* in the nasal glands of chronically infected birds may be an important source of organisms.

Longterm inapparent infections lasting for months to years are common and are considered the normal *Chlamydia*-host relationship. The prevalence of infection varies considerably between species and by geographic location. Infection is endemic in commercial turkey flocks; no clinical signs or mild respiratory signs and low mortality are the common presentations. Outbreaks are rare. Although chickens are relatively resistant to clinical disease, asymptomatic infection is frequent. Epidemiologic studies report prevalence varying from 10% to >90% using serology, culture, or PCR detection; 3%–50% of surveyed wild avian populations may be seropositive.

Clinical Findings and Lesions:

Severity of clinical signs and lesions depends on the virulence of the organism, infectious dose, stress factors, and susceptibility of the bird species; asymptomatic infections are common. Nasal and ocular discharge, conjunctivitis, sinusitis, **green to yellow-green droppings**, fever, inactivity, ruffled feathers, weakness, inappetence, and weight loss can be seen in clinically affected birds. Clinical pathology test results vary with the organs most affected and severity of the disease. Hematologic changes most often present are anemia and leukocytosis with heterophilia and monocytosis. Plasma bile acids, AST, LDH, and uric acid may be increased. A radiograph or a laparoscopy may reveal an enlarged liver and spleen and thickened airsacs. **Necropsy** findings in acute infections include **serofibrinous polyserositis** (airsacculitis, pericarditis, perihepatitis, peritonitis), pneumonia, hepatomegaly, and splenomegaly. Multiple tan to **white to yellow foci and/or petechial hemorrhages** can **be seen in the liver and spleen.** Similar lesions are seen in other systemic bacterial infections and are not specific for avian chlamydiosis. Multifocal necrosis in the liver and spleen is associated with small granular, basophilic intracytoplasmic bacterial inclusions in multiple cell types; occasional heterophils; and increased mononuclear cells (macrophages, lymphocytes, plasma cells) in hepatic sinusoids and splenic sinuses. Necrosis results from direct cell lysis or vascular damage. The latter is also the source of the generalized serofibrinous exudate. In chronic infections, enlargement and discoloration of the spleen or liver may be noted. Necrosis and bacterial inclusions are not seen, but the mononuclear cell response is present in these birds. Lesions are usually absent in latently infected birds, even though *C psittaci* is often being shed.

Acute chlamydiosis

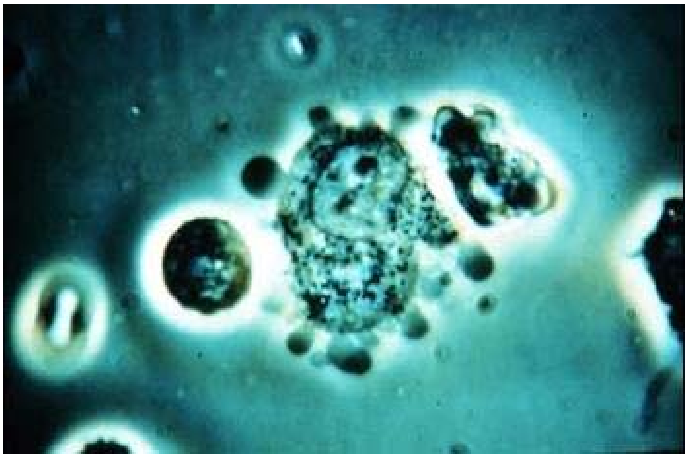
Courtesy of Dr. A. J. Van Wettere.

Chlamydiosis

Courtesy of Dr. A. J. Van Wettere.

Diagnosis:

Because of the variety of clinical presentations and common occurrence of latently infected carriers, no single diagnostic test can reliably determine infection. Procedures to detect the organism or antibodies are used. In general, the more acute the disease, the greater the number of infective organisms and the easier it is to make a diagnosis. When birds are acutely ill, clinical findings, including hematology, clinical chemistries, and radiology or typical gross lesions are adequate for a tentative diagnosis.

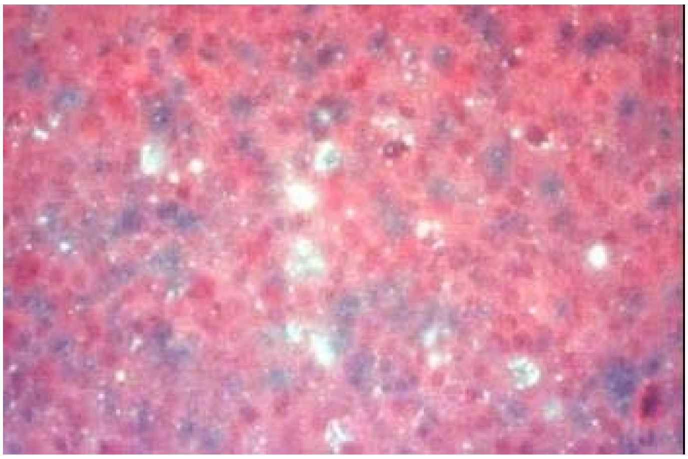


***Chlamydia psittaci* , elementary bodies**
Courtesy of Dr. Jean Sander.

The combination of a serologic and an antigen detection test, especially PCR, or culture, is a practical diagnostic scheme to confirm chlamydiosis. In live birds, the preferred sample for bacterial culture or PCR is a single conjunctival, choanal, or cloacal swab. Multiple samples collected throughout 3–5 days are recommended for detection of intermittent shedding by asymptomatic birds.

Antibodies may or may not be detectable depending on the test used and on the level and stage of infection. Interpretation of titers from single serum samples is difficult. A 4-fold increase in titers between paired acute and convalescent samples is diagnostic, and high titers in a majority of samples from several birds in a population are sufficient for a presumptive diagnosis. Serologic methods include direct and modified direct complement fixation, elementary body agglutination, antibody ELISA, and indirect immunofluorescence. The elementary body agglutination test detects IgM and is useful to determine recent infection. The complement fixation methods are more sensitive than agglutination methods. High antibody titers may persist after treatment and complicate evaluation of subsequent tests.

Antigen detection methods include immunohistochemistry (eg, immunofluorescence, immunoperoxidase), ELISA, and PCR. ELISA kits developed for detection of *Chlamydia trachomatis* in people are available commercially and are relatively inexpensive. Their exact specificity and sensitivity for detection of *C psittaci* is most often unknown; they appear to have good specificity but somewhat low sensitivity. These kits are most useful when birds are clinically ill. PCR is the most sensitive and specific test, but results may differ between laboratories because of the lack of standardized PCR primers and laboratory method variations. False-positive results are a concern with PCR, because cross-contamination can occur relatively easily. The organism can also be identified in impression smears of affected tissues (eg, liver, spleen, and lung). Chlamydiae stain purple with Giemsa and red with Macchiavello and Gimenez stains.



***Chlamydia psittaci* , fluorescent antibodies**
Courtesy of Dr. Jean Sander.

Immunohistochemistry is usually more sensitive than the histochemical stains mentioned above for detecting bacteria in tissue.

Confirmation requires isolation and identification of *C psittaci* in chick embryo or cell cultures (BGM, L929, Vero) at a qualified laboratory. Cloacal, choanal, oropharyngeal, conjunctival, or fecal swabs (in a special *Chlamydia* transport media) from live birds, or tissues (liver and spleen preferred) from dead birds should be refrigerated and submitted promptly to the laboratory. Freezing, drying, improper handling, and improper transport media can affect viability. The laboratory should be contacted for directions to submit samples. Concurrent infections with other, more easily diagnosed diseases (eg, colibacillosis, pasteurellosis, herpesvirus infections, mycotic diseases) may mask chlamydial infection. Laboratory and clinical findings should be correlated. Chlamydiosis must be distinguished from other respiratory and systemic diseases of birds.

Prevention and Treatment:

Human and avian chlamydiosis is a reportable disease; state and local governmental regulations should be followed wherever applicable. No effective vaccine for use in birds is available. Treatment prevents mortality and shedding but cannot be relied on to eliminate latent infection; shedding may recur. Tetracyclines (chlortetracycline, oxytetracycline, doxycycline) are the antibiotics of choice. Drug resistance to tetracyclines is rare, but reduced sensitivity requiring higher dosages is becoming more common. Tetracyclines are bacteriostatic and effective only against actively multiplying organisms, making extended treatment times (from 2–8 wk, during which minimum-inhibitory concentrations in blood must be consistently maintained) necessary. When tetracyclines are administered orally, additional sources of dietary calcium (eg, mineral block, supplement, cuttle bone) should be reduced to minimize interference with drug absorption.

Outbreaks of clinical disease in poultry flocks are not common. Treating infected flocks with chlortetracycline at 400–750 g/ton of feed for a minimum of 2 wk has effectively decreased potential risk of infection for plant employees. The medicated feed must be replaced by nonmedicated feed for 2 days before slaughter and processing. Calcium supplementation must be withheld during treatment with chlortetracycline, with calcium concentration in the feed reduced to ≤0.7%. Medicated feed should be provided for 45 days if elimination of the organism is attempted. Use of some tetracycline antibiotics and doxycycline in poultry is prohibited, and state regulations should be followed. Persistence of oxytetracycline residues in eggs of laying hens is 9 days, and persistance of doxycycline residues is 26 days after administration at 0.5 g/L for 7 days.

In pigeons and companion birds, use of chlortetracycline-medicated feeds for 45 days was historically a standard recommendation for imported birds (see Chlamydiosis). Difficulties in palatability of the feed itself or the high level of antibiotic necessary for adequate blood levels have limited its use. Doxycycline is the current drug of choice, because it is better absorbed, has less affinity for calcium, better tissue distribution, and a longer half-life than other tetracyclines. Doxycycline added to feed or water can also result in adequate blood levels and has less effect on normal intestinal flora than does chlortetracycline. The dosage and duration of the treatment varies between species. Protocols derived from controlled studies performed in the particular species treated should be used when available (see Chlamydiosis). Also see information in the Compendium of Measures To Control *Chlamydophila psittaci* Infection Among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2010, National Association of State Public Health Veterinarians (NASPHV). When specific information is lacking, an empiric starting dosage of 400 mg/L of water, or 25–50 mg/kg/day, PO, has been suggested.

Appropriate biosecurity practices are necessary to control the introduction and spread of chlamydiae in an avian population. Minimal standards include quarantine and examination of all new birds, prevention of exposure to wild birds, traffic control to minimize cross-contamination, isolation and treatment of affected and contact birds, thorough cleaning and disinfection of premises and equipment (preferably with small units managed on an all-in/all-out basis), provision of uncontaminated feed, maintenance of records on all bird movements, and continual monitoring for presence of chlamydial infection.

The organism is susceptible to heat (it may be destroyed in <5 min at 56°C) and most disinfectants (eg, 1:1,000 quaternary ammonium chloride, 1:100 bleach solution, 70% alcohol, etc) but is resistant to acid and alkali. It may persist for months in organic matter such as litter and nest material, but thorough cleaning before disinfection is necessary.

Zoonotic Risk:

Avian chlamydiosis is a zoonotic disease that can affect people after exposure to aerosolized organisms shed from the digestive or respiratory tracts of infected live or dead birds or by direct contact with infected birds or tissues. Human disease most often results from exposure to pet psittacines and can occur even if there is only brief contact with a single infected bird. Other persons in close contact with birds such as pigeon fanciers, veterinarians, farmers, wildlife rehabilitators, zoo keepers, and employees in slaughtering and processing plants or hatcheries are also at risk. Recent studies showed that zoonotic transmission of *C psittaci* in poultry industry workers is likely underestimated. Precautions should be taken when examining live or dead infected birds to avoid exposure (eg, dust mask and plastic face shield or goggles, gloves, detergent disinfectant to wet feathers, and fan-exhausted examining hood).

Some individuals, especially pregnant women and those with impaired immunity, are more susceptible than others. The illness in people is usually respiratory and varies from flu-like symptoms to systemic disease with pneumonia and possibly endocarditis and encephalitis.

11	12 M	13	14	15	16 M	17	18	19 M	20

A 5 kg (11 lb) cat is prescribed buprenorphine at a dosage of 20 mcg/kg for transmucosal administration. The concentration of buprenorphine in the vial is 0.6 mg/ml. What is the dose of buprenorphine in milliliters for this cat?

0.17 ml	HIDE
0.02 ml	HIDE
0.34 ml	HIDE
1.67 ml	HIDE

The dose for this cat is 0.17 ml.

20 mcg/kg x 1 mg/1000 mcg = 0.02 mg/kg

5 kg x 0.02 mg/kg = 0.1 mg

0.1 mg x 1 ml/0.6 mg = 0.17 ml

Calculation questions are different from other questions, and they can be intimidating. The key is to break them down into one step at a time and then solve each step.

Refs: Bassert and Thomas, McCurnin's Clinical Textbook for Veterinary Technicians, 9th ed. pp. 978-9 and Plumb's Veterinary Drug Handbook, 8th edition, *Buprenorphine HCl*.

zukureview SAVE & EXIT

PREV NEXT

21	22	23	24	25	26	27	28	29	30

A dog is presented with muzzle swelling caused by a bee sting. The dog is 75 lbs, and is having trouble breathing. Besides administering oxygen, treatment is IM Diphenhydramine HCl [benadryl tm] at 2mg/lb.

If the Diphenhydramine is in a concentration of 100mg/ml, how many milliliters will be needed for one dose?

1.50 milliliters	HIDE
75 millilters	HIDE
100 milliliters	HIDE
.96 milliliters	HIDE
7.50 milliliters	HIDE

BACK NEXT LEAVE BLANK

Correct:

1.50 milliliters.

To determine this answer you'll need to find the milligrams [mg] in one dose, then divide that by the concentration.

To find how many mg in the dose, multiply animal's weight by mg/lb.

75 pounds[lb] x 2 mg/lb = 150. That gives you the mgs in the dose-150, then divide that by 100 mg/ml to find the milliliters in one dose.

150mg ÷ 100/mg/milliliters[ml]= 1.5.

150mg ÷ 100/mg/milliliters[ml]= 1.5.

lbs x dosage = grams

grams ÷ concentration = milliliters

75 x 2 = 150

150 ÷ 100 mg/ml = 1.5

Refs: Pasquini's, Tschauner's Guide to Small Animal Clinics, vol 1, 2nd ed. p. 706 and the Merck Veterinary Manual online edition.

You need to provide IV potassium supplementation in a hypokalemic horse (serum potassium, 2.2 mEq/L) weighing 450 kg. You remember that potassium should not be given at a rate over 0.5 mEq/kg/hour.

Which of the following is the absolute highest safe amount of KCl to add to 10 L of 0.9% NaCl for administration at a rate of 2L/hour to this horse?

1 mEq/L	HIDE
2250 mEq	HIDE
450 mEq/L	HIDE
1125 mEq	HIDE
Need more information	HIDE

The addition of 1125 mEq to 10 L (or 112.5 mEq/L) of KCl is the highest safe dose this horse can receive (at 0.5 mEq/kg/hour).

Calculation:

Maximum rate of KCl you can give the horse is 0.5mEq/kg/hr

This horse weighs 450 kg

450 x 0.5 = 225 mEq

225 mEq/hr is the maximum rate of KCl this horse can safely receive

If you are making up a 10L bag of saline and running it at 2L/hr, this bag will last 5 hours

225 mEq/hr x 5 hr = 1125mEq

A 44-lb (20 kg) dog develops ventricular tachycardia after a splenectomy and requires an IV constant rate infusion (CRI) of lidocaine. The CRI dosage of lidocaine is 50 mcg/kg/min.

How many milligrams of lidocaine need to be added to a 1000-ml bag of Lactated Ringer's Solution that will be administered at a rate of 45 ml/hr?

1767 mg	HIDE
2933 mg	HIDE
1333 mg	HIDE
972 mg	HIDE
222 mg	HIDE

Correct:

1333 mg need to be added to a 1000-ml bag.

Dosage of lidocaine in mg: 50 mcg/kg/min x 1 mg/1000 mcg = 0.05 mg/kg/min

Dosage of lidocaine for this dog: 0.05 mg/kg/min x 20 kg dog = 1 mg/min

1 mg/min x 60 min/hr = 60 mg/hr

60 mg/hr x 1 hr/45ml x 1000ml/L = 1333 mg/L

Calculation questions are different from other questions, and they can be intimidating. The key is to break them down into one step at a time and then solve each step.

You must treat a 1000-lb cow infected with *Eimeria bovis* (an intestinal parasite) using 9.6% amprolium oral solution.

The dose is 10mg/kg PO SID for 5 days.

How much amprolium do you give this cow, and how often each day?

9.6 ml, once a day	HIDE
96 cc, twice a day	HIDE
47 ml, once a day	HIDE
4.7 cc, once a day	HIDE

Correct:

47 ml, once a day.

A cc is cubic centimeter, which is the same volume as a milliliter, (ml). SID means once a day.
9.6% concentration contains 96 mg amprolium per ml solution.
1000 lb cow = 454 kg, (1000lb / 2.2lb/kg = 454 kg).
The dose for this cow will be 454 kg x 10 mg/kg =4540 mg.
To get the dose in ml divide 4540 mg by 96 mg/ml.
4540 mg / 96 mg/ml =47 ml

Eimeria (and *Isospora*) are intestinal protozoal parasites (also called coccidia).

Refs: Plumb's Vet Drug Handbook, 7th ed. pp. 97-9 and the Merck Veterinary Manual online.

Overview of Coccidiosis

By **Peter D. Constable, BVSc (Hons), MS, PhD, DACVIM, Dean, College of Veterinary Medicine, University of Illinois**

Coccidiosis is usually an acute invasion and destruction of intestinal mucosa by protozoa of the genera *Eimeria* or *Isospora*. Clinical signs include diarrhea, fever, inappetence, weight loss, emaciation, and in extreme cases, death. However, many infections are subclinical. Coccidiosis is an economically important disease of cattle, sheep, goats, pigs, poultry (see Coccidiosis), and also rabbits, in which the liver as well as the intestine can be affected (see Coccidiosis). In dogs, cats, and horses, coccidiosis is less often diagnosed but can result in clinical illness. Other genera, of both hosts and protozoa, can be involved (see Cryptosporidiosis, Sarcocystosis, and Toxoplasmosis).

Etiology and Epidemiology:

Eimeria and *Isospora* typically require only one host in which to complete their life cycles. Some species of *Isospora* have facultative intermediate (paratenic or transfer) hosts, and a new genus name, *Cystoisospora*, has been proposed for these species of *Isospora*. Coccidia are host-specific, and there is no cross-immunity between species of coccidia.

Coccidiosis is seen universally, most commonly in young animals housed or confined in small areas contaminated with oocysts. Coccidia are opportunistic pathogens; if pathogenic, their virulence may be influenced by various stressors. Therefore, clinical coccidiosis is most prevalent under conditions of poor nutrition, poor sanitation, or overcrowding, or after the stresses of weaning, shipping, sudden changes of feed, or severe weather.

In general, for most species of farm animals, the infection rate is high and rate of clinical disease is low (5%–10%), although up to 80% of animals in a high-risk group may show clinical signs. Most animals acquire *Eimeria* or *Isospora* infections of varying severity when between 1 mo and 1 yr old. Older animals usually are resistant to clinical disease but may have sporadic inapparent infections. Clinically healthy, mature animals can be sources of infection to young, susceptible animals.

Pathogenesis:

Infection results from ingestion of infective oocysts. Oocysts enter the environment in the feces of an infected host, but oocysts of *Eimeria* and *Isospora* are unsporulated and therefore not infective when passed in the feces. Under favorable conditions of oxygen, humidity, and temperature, oocysts sporulate and become infective in several days. During sporulation, the amorphous protoplasm develops into small bodies (sporozoites) within secondary cysts (sporocysts) in the oocyst. In *Eimeria* spp, the sporulated oocyst has four sporocysts, each containing two sporozoites; in *Isospora* spp, the sporulated oocyst has two sporocysts, each containing four sporozoites.

When the sporulated oocyst is ingested by a susceptible animal, the sporozoites escape from the oocyst, invade the intestinal mucosa or epithelial cells in other locations, and develop intracellularly into multinucleate schizonts (also called meronts). Each nucleus develops into an infective body called a merozoite; merozoites enter new cells and repeat the process. After a variable number of asexual generations, merozoites develop into either macrogametocytes (females) or microgametocytes (males). These produce a single macrogamete or a number of microgametes in a host cell. After being fertilized by a microgamete, the macrogamete develops into an oocyst. The oocysts have resistant walls and are discharged unsporulated in the feces. Oocysts do not survive well at temperatures below ~30°C or above 40°C; within this temperature range, oocysts may survive ≥1 yr.

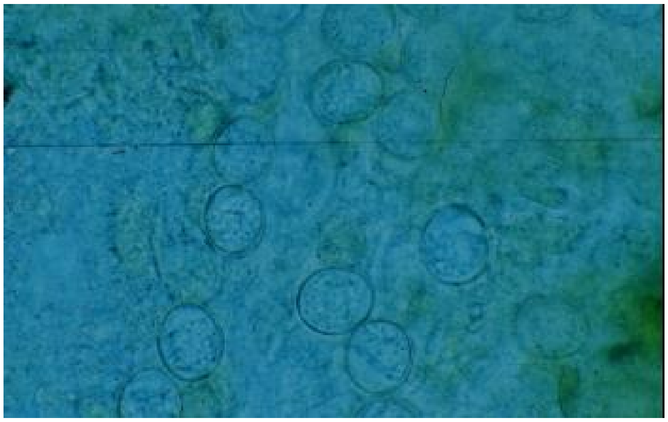
Of the numerous species of *Eimeria* or *Isospora* that can infect a particular host, not all are pathogenic. Concurrent infections with two or more species, some of which may not normally be considered pathogenic, also influence clinical disease. Within pathogenic species, strains may vary in virulence.

Clinical Findings:

Clinical signs of coccidiosis are due to destruction of the intestinal epithelium and, frequently, the underlying connective tissue of the mucosa. This may be accompanied by hemorrhage into the lumen of the intestine, catarrhal inflammation, and diarrhea. Signs may include discharge of blood or tissue, tenesmus, and dehydration. Serum protein and electrolyte concentrations (typically hyponatremia) may be appreciably altered, but changes in Hgb or PCV are seen only in severely affected animals.

Diagnosis:

Oocysts can be identified in feces by salt or sugar flotation methods. Finding appreciable numbers of oocysts of pathogenic species in the feces is diagnostic (>100,000 oocysts/g of feces in severe outbreaks), but because diarrhea may precede the heavy output of oocysts by 1–2 days and may continue after the oocyst discharge has returned to low levels, it is not always possible to find oocysts in a single fecal sample; multiple fecal examinations of one animal or single fecal examinations of animals housed in the same environment may be required. The number of oocysts present in feces is influenced by the genetically determined reproductive potential of the species, the number of infective oocysts ingested, stage of the infection, age and immune status of the animal, prior exposure, consistency of the fecal sample (free water content), and method of examination. Therefore, the results of fecal examinations must be related to clinical signs and intestinal lesions (gross and microscopic). Furthermore, the species must be determined to be pathogenic in that host. The finding of numerous oocysts of a nonpathogenic species concurrent with diarrhea does not constitute a diagnosis of clinical coccidiosis.



Eimeria zuernii oocysts, fecal smear

Courtesy of Dr. Sameeh M. Abutarbush.

Isospora amphiboluri oocysts

Courtesy of Dr. Roger Klingenberg.

Treatment:

The life cycles of *Eimeria* and *Isospora* are self-limiting and end spontaneously within a few weeks unless reinfection occurs. Prompt medication may slow or inhibit development of stages resulting from reinfection and, thus, can shorten the length of illness, reduce discharge of oocysts, alleviate hemorrhage and diarrhea, and lessen the likelihood of secondary infections and death. Sick animals should be isolated and treated individually whenever possible to ensure delivery of therapeutic drug levels and to prevent exposure of other animals. However, the efficacy of treatment for clinical coccidiosis has not been demonstrated for any drug, although it is widely accepted that treatment is effective against reinfection and should therefore facilitate recovery.

Most coccidiostats have a depressant effect on the early, first-stage schizonts and are therefore more appropriately used for control instead of treatment. Soluble sulfonamides are commonly administered orally to calves with clinical coccidiosis and are perceived to be more effective than intestinal sulfonamide formulations (boluses). Amprolium is also administered orally to calves, sheep, and goats with clinical coccidiosis. Preventive treatment of healthy exposed animals as a safeguard against additional morbidity is an important consideration when treating individual animals with clinical signs. The FDA is changing the marketing status of drugs, such as the sulfonamides that are used in human medicine, from over-the-counter to (veterinary) prescription for water medication or Veterinary Feed Directive (VFD) for feed medication. Drugs, such as the ionophores, that are not used in human medicine will continue to have an over-the-counter marketing status.

Prevention:

Prevention is based on limiting the intake of sporulated oocysts by young animals so that an infection is established to induce immunity but not clinical signs. Good feeding practices and good management, including sanitation, contribute to this goal. Neonates should receive colostrum. Young, susceptible animals should be kept in clean, dry quarters. Feeding and watering devices should be clean and must be protected from fecal contamination; this usually means feed is placed in troughs above the ground and positioned so that it is difficult for fecal contamination of feed to occur. Stresses (eg, weaning, sudden changes in feed, and shipping) should be minimized.

Preventive administration of coccidiostats is recommended when animals under various management regimens can be predictably expected to develop coccidiosis. In virtually all cases, *Eimeria* spp are implicated. Decoquinate and ionophorous antibiotics are widely used for this purpose in young ruminants. Continuous low-level feeding of decoquinate, lasalocid, monensin, or amprolium during the first month of feedlot confinement has been reported to have preventive value. Ionophorous antibiotics and amprolium have been reported to be effective in goat kids, as have sulfonamides and amprolium in pigs.

MERCK

A 7-year old female spayed domestic shorthair cat with a normal body condition score is presented for an annual exam. The cat weighs 11.4 lb (5.18 kg).

The cat normally eats an over-the-counter dry formulation and the owner has recently switched brands. The new brand has 150 kcal/cup.

Based on the linear formula for RER (resting energy requirement), how many cups of the new food should the cat per day eat to maintain her weight?

1 cup	HIDE
2.5 cups	HIDE
3/4 cup	HIDE
2 cups	HIDE
1.5 cups	HIDE

Correct:

The cat should eat 1.5 cups of food (225 kcal) per day.

The linear formula for RER in kcal/day = (30 x body weight in kg) + 70

= (30 x 5.18) + 70

RER = 225 kcal/day

There are 150 kcal/cup.

225/150 = 1.5 cups per day

Refs: Merck Veterinary Manual online edition

A calf with pinkeye is being treated with an injection of long acting oxytetracycline.

The calf weighs 100 lbs and the dose is 10mg/kg. How many milligrams will be needed for one dose?

Click here to see:

Typical pinkeye

2200 milligrams	HIDE
4.5 milligrams	HIDE
22 milligrams	HIDE
75 milligrams	HIDE
454.5 milligrams	HIDE

A calf wi

The calf
one dose

Click her

Typical p

To make this calculation, you must first convert pounds(lbs) to kilograms(kg).

There are 2.2 lbs in a kg. To convert lbs to kg divide lbs by 2.2.

So 100 lbs ÷ 2.2 = 45.45 kg.

Since the dose is 10 mg per kg, multiply the 45.45 kg from the first step by 10.

(lbs÷2.2lbs/kg) × mg/kg= one dose

(100 lbs ÷ 2.2lb/kg) × 10mg/kg

45.45 kg × 10 mg/kg = 454.5 mg

Infectious keratoconjunctivitis (pinkeye) in cattle is usually caused by *Moraxella bovis*.

4.5 milli	
2200 milligrams	HIDE
22 milligrams	HIDE
75 milligrams	HIDE
454.5 milligrams	HIDE

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THE MERCK VETERINARY MANUAL

Multimedia

Courtesy of Dr. John A. Angelos.

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A 3 day old, 110 pound, Holstein heifer calf with a history of watery diarrhea for 36 hours is presented in lateral recumbency.

Her temperature is 95F (35C) [N =100.4–102.8F (38.0–39.3C)],
heart rate is 190 beats minute [N 100-140],
respiratory rate is 64 breaths per minute [N 26-50].

She quite thin and barely responds to examination.

The mucous membranes are pale and dry, bluish in color, and the capillary refill time is 4 seconds. Her eyes are sunken, and a skin tent remains in place.

If the estimated dehydration is at least 10%, which of the following is the correct volume of fluid required for initial resuscitation of this calf?

1 liter	HIDE
50 liters	HIDE
10 liters	HIDE
5 liters	HIDE

Estimation Of % Dehydration				
Clinical signs	Skin Elasticity (tenting)**	Mucous membranes	Capillary refill time (CRT)	Signs of Shock: ↑↑HR weak pulses cool extremities
<5%	-	-	-	-
5-6%	+/-	Probably ok	+/-↑	Not likely
6-8%	Slow return	+/- Dry	Mild ↑	Maybe
10-12%	Very slow	Dry	↑↑	Likely
12-15%	May not retract	Very dry	↑↑↑↑	Severe
** Body condition may obscure elasticity testing: ↑tenting if thin, ↓ if fat				

A 3 day old, 110 pound, Holstein heifer calf with a history of watery diarrhea for 36 hours is presented in lateral recumbency.

Her temp
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fluid requ

1 liter
10 liters
5 liters
50 liters HIDE

BACK NEXT

Overview | Mark this Question | Lab Values | Definitions | Report a Problem

Correct:

5 liters is the initial fluid volume required. This is calculated from the % dehydration estimated from the physical examination.

Fluid deficit is calculated from - % dehydration X body weight in kg = the # of liters required.

100 pounds / 2.2 = 50 kg.

50 kg X 0.1 = 5 liters

Click to view a chart with guidelines to estimate dehydration.

Refs: McCurnin's Clin Textbk for Vet Techs, 8th ed. p. 883 and the Merck Veterinary

A veterinarian selects gabapentin as a medication for a boxer dog in chronic pain. The dose is 10 mg/kg PO twice daily.

The dog weighs 30 kg. Available gabapentin tablets are 100 mg/tablet.

How many tablets are required to treat this dog for one week?

96 tablets	HIDE
28 tablets	HIDE
14 tablets	HIDE
42 tablets	HIDE
21 tablets	HIDE

31 M

A veterir
is 10 mg

The dog

How mar

Correct:

42 tablets of gabapentin are required to treat this dog for one week.

10 mg/kg (30 kg) = 300 mg/dose x 2 doses/day = 600 mg/day

600 mg/day x 7 days = 4200 mg/100 mg/tablet = 42 tablets

Refs: The Merck Veterinary Manual online.

96 table	
42 table	
14 tablets	HIDE
21 tablets	HIDE
28 tablets	HIDE

A 500-kg mare that foaled the night before is presented in hemorrhagic shock due to rupture of the uterine artery into the uterus (so she is hemorrhaging into the uterus).

Her PCV is 18%, her lactate is 4.2 mmol/L, and she is tachycardic and tachypneic.

What volume of blood will need to be collected from the blood donor (whose PCV is 35%) in order to transfuse her to achieve a PCV of 25%? Assume that blood volume is 80 ml/kg.

4L	HIDE
8L	HIDE
10L	HIDE
12L	HIDE
6L	HIDE

1

×

Correct:

8 L should be collected.

Blood transfusion volume (in mL) = (weight (in kg) x blood volume (in mL/kg) x [desired PCV – actual PCV])/donor PCV.

So, blood transfusion volume (in mL) = (500kg x 80mL/kg x [25–18])/35 blood transfusion volume (in mL) = 8 L

Refs: Bassert and Thomas, McCurnin's Clinical Textbook for Veterinary Technicians, 8th edition, pp. 902–3.

A 500-kg
rupture

Her PCV

What vol
order to

4L	
8L	HIDE
10L	HIDE
12L	HIDE
6L	HIDE

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zukureview

SAVE & EXIT

PREV NEXT

1	2 M	3	4	5	6	7	8 M	9	10

In a 1:10 solution of betadine to water, how many milliliters of water are there for each milliliter of betadine?

9	HIDE
90	HIDE
50	HIDE
11	HIDE
100	HIDE

BACK NEXT LEAVE BLANK

Overview | Mark this Question | Lab Values | Definitions | Report a Problem

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SAVE & EXIT

PREV

1

In a 1:1(
milliliter

9

50

90

100

11 HIDE

BACK NEXT

Overview | Mark this Question | Lab Values | Definitions | Report a Problem

Correct:

1 to 10 means that for every 1 ml of betadine, there are 9 ml of water.

Refs: Bassert and Thomas, McCurnin's Clinical Textbook for Veterinary Technicians, 8th ed. pp. 1040-3.