Management of Parvovirus in Animal Shelters

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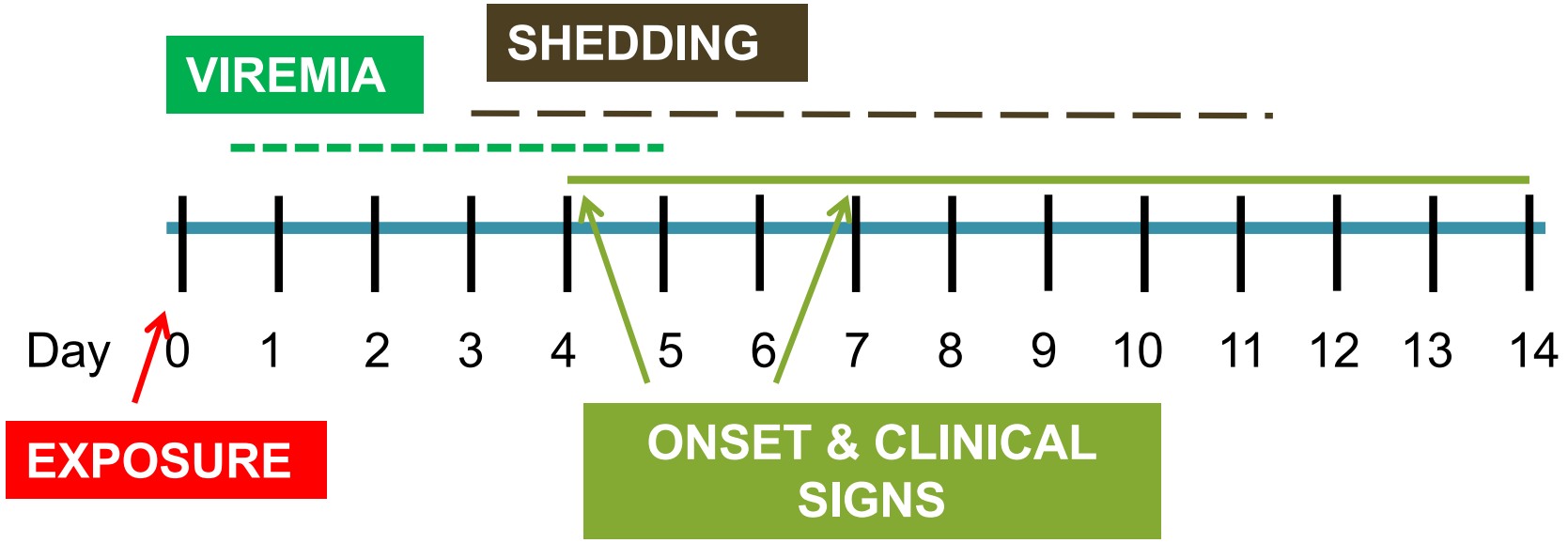
A History Lesson…

- Feline Panleukopenia identified in 1962
- Canine Parvovirus emerged in 1970s
  - CPV-2c first detected in Italy in 2000
- Expectations are higher than ever
- Rescue transport programs

The culprit…

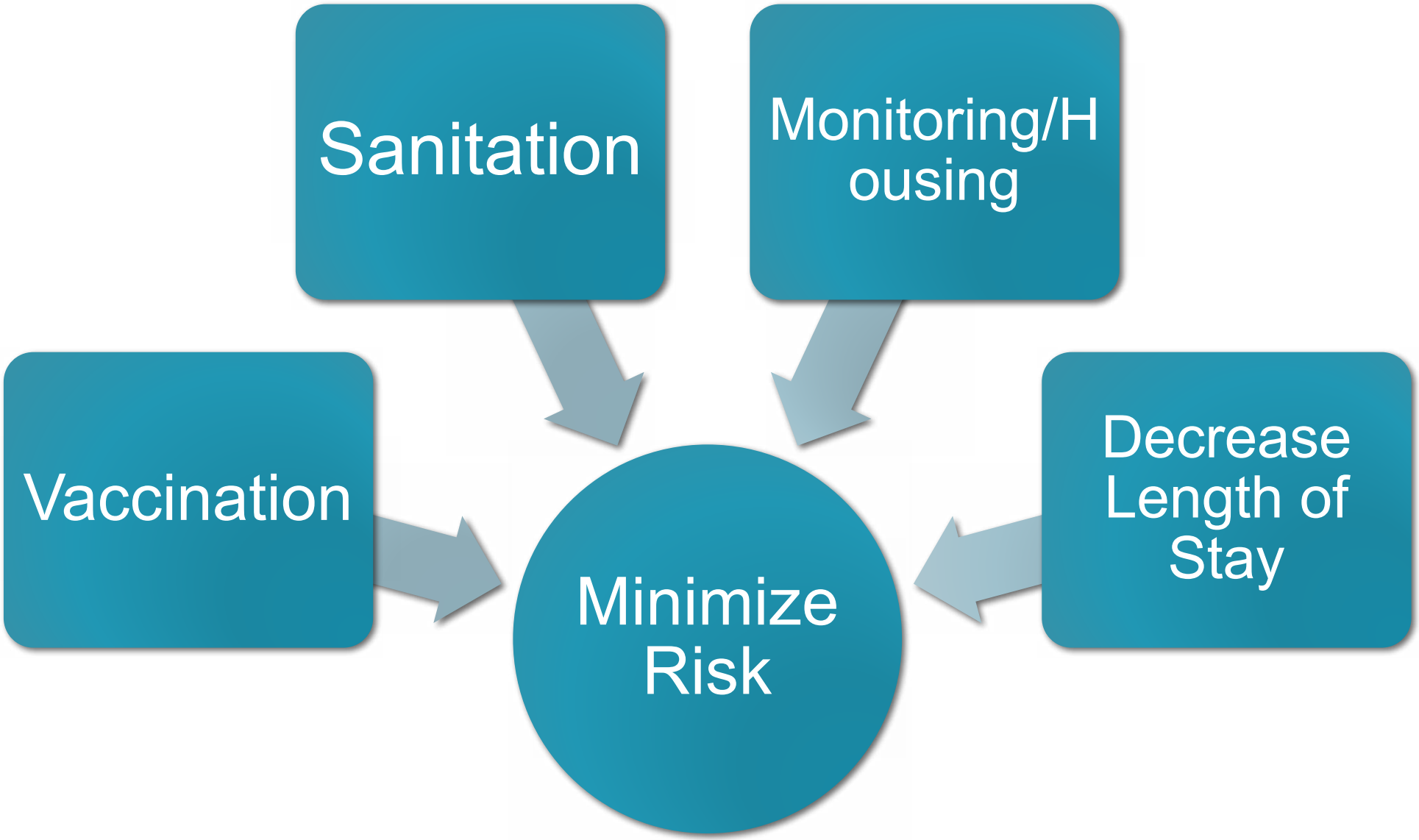
- Non-enveloped DNA virus, persistent in environment
- Vaccines are reliable and effective
- Can infect any naïve, unvaccinated animal
  - Irrespective of age or breed
- Clinical signs
  - Gastrointestinal (vomiting, diarrhea, anorexia)
  - Lethargy, fever, sudden death
  - Leukopenia
- Subclinical or mild signs possible with partial protection (may see in littermates)

Course of disease



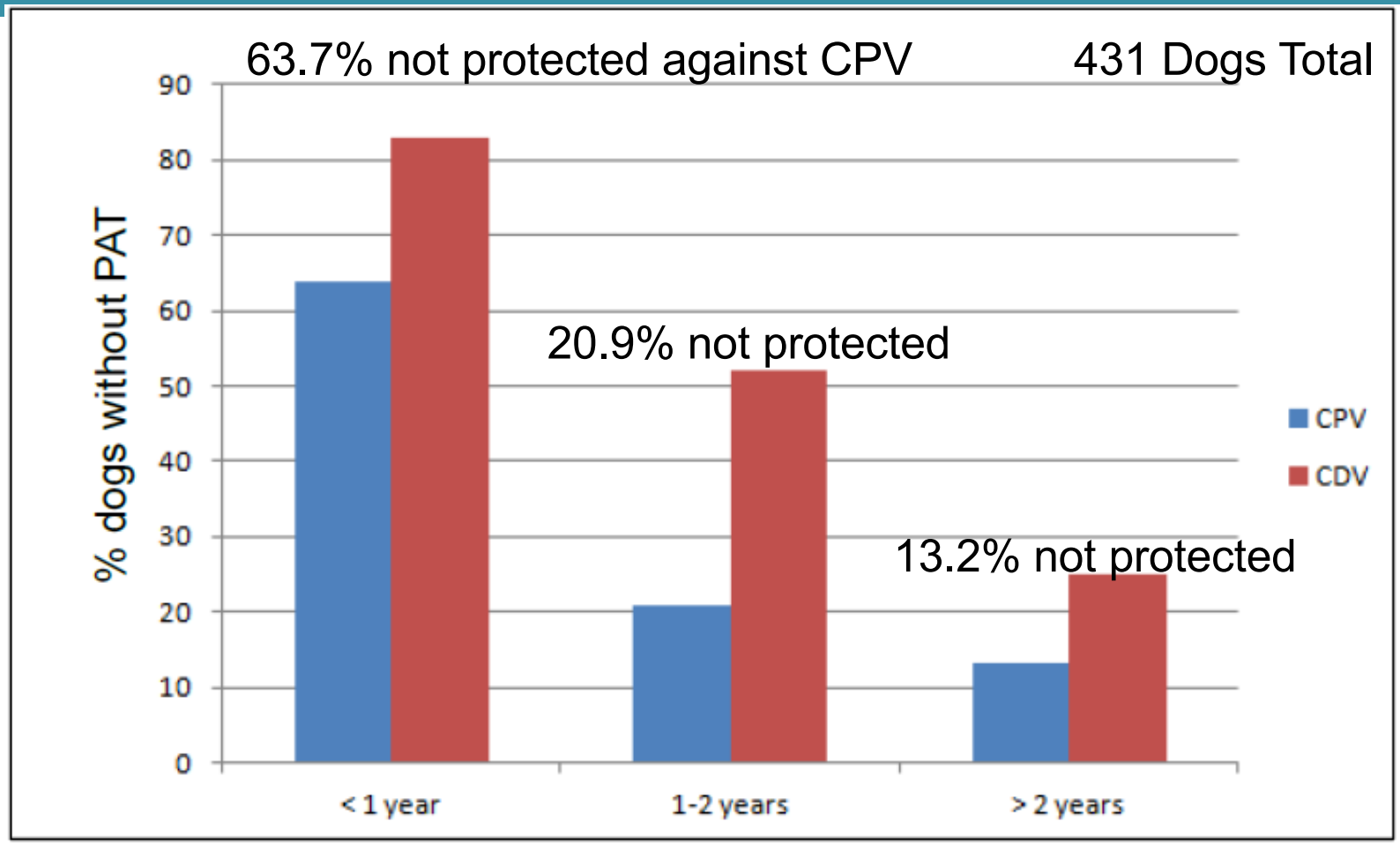
- Incubation: 3-14 days, usually 4-6 days
- Shed virus 2-3 days before clinical signs and up to 14 days after recovery
- No “carrier state” in dogs

Multiple Methods of Prevention



Prevention – Vaccination

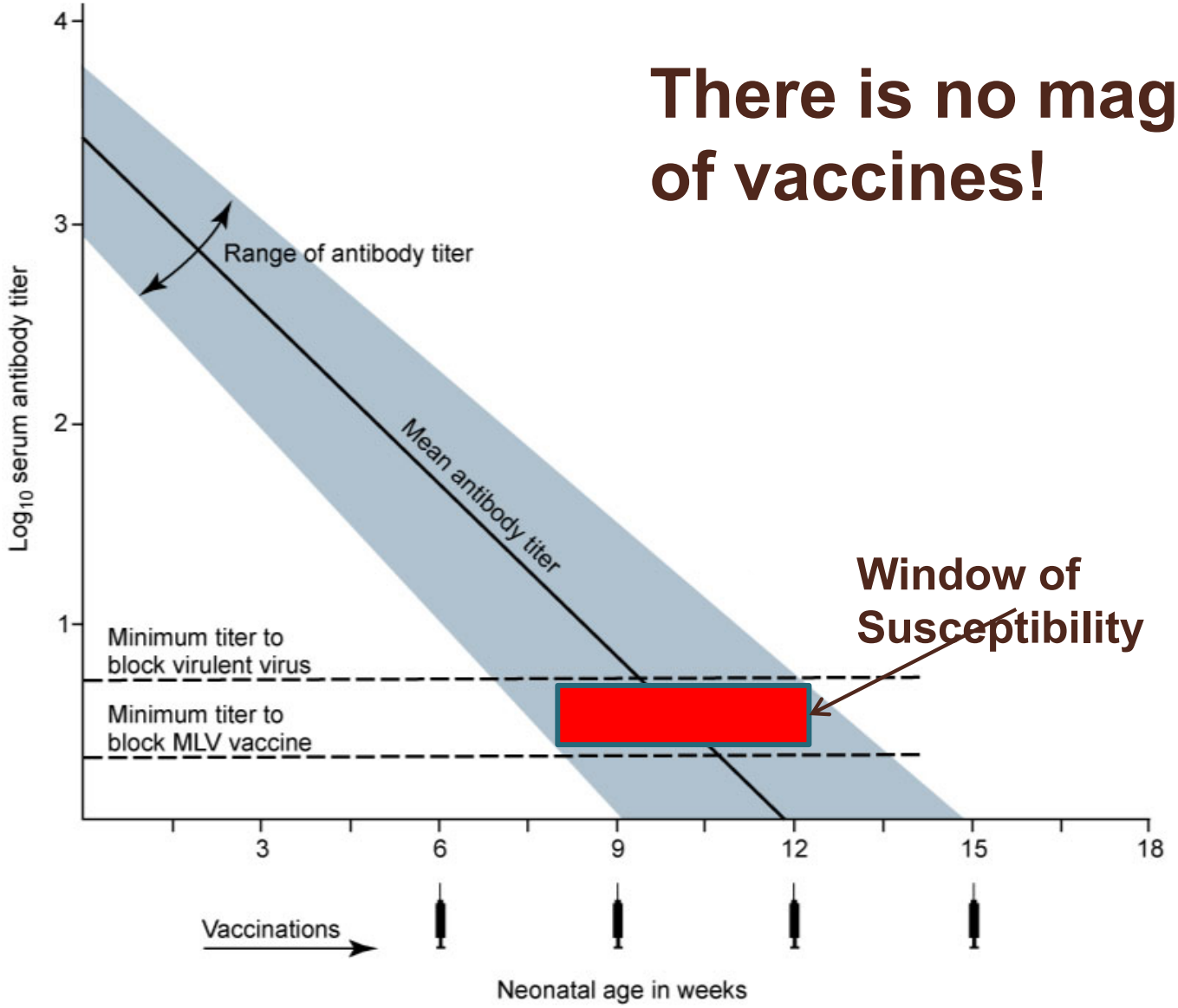
- AAHA and AAFP published guidelines contain shelter specific recommendations
- Vaccinate juveniles every 2 weeks until 20 weeks
- Vaccinate adults once at intake and again in 2 weeks if resources permit
- Vaccinate at or before intake



"Results suggest that many dogs entering a shelter will have insufficient antibody titers against fatal but preventable diseases. Restricting vaccination to some dogs while excluding others on the basis of source, health status, potential outcome, or any other criteria contributes to the risk of transmission of infectious diseases within the shelter."

Lechner ES, et al. Prevalence of protective antibody titers for canine distemper virus and canine parvovirus in dogs entering a Florida animal shelter. JAVMA 2010;236 (12):1317-21

Maternal Antibody Interference



Prevention – Sanitation

Remember common use areas! Intake processing, vehicles, carriers, scales, clinic areas

Prevention – Monitoring/Housing

Remove symptomatic animals from the general population to isolation immediately

Use guillotine doors as designed

Avoid random comingling, do not mix litters

Evaluate before cleaning, during feeding

Monitor appetite with canned food

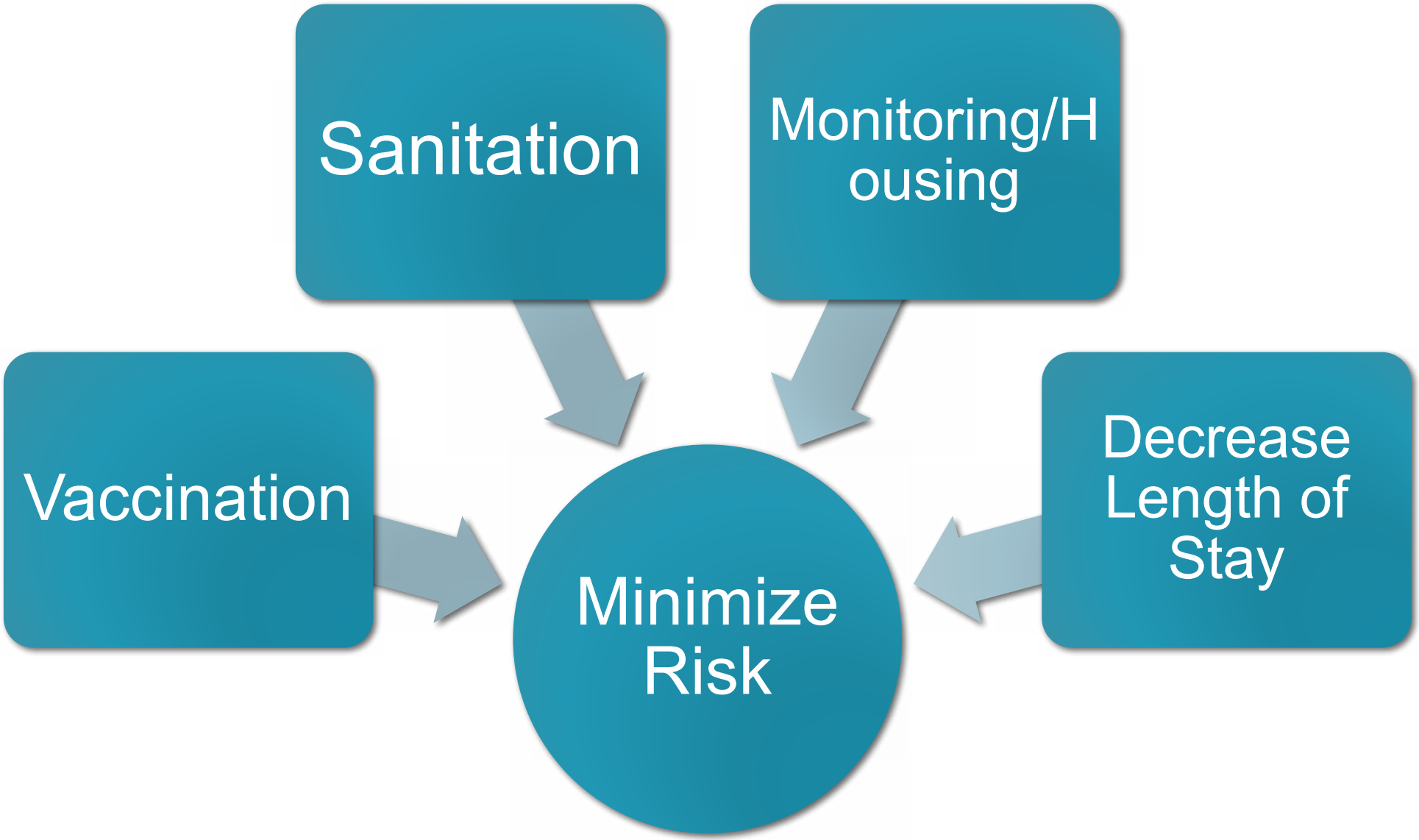
Prevention – Decrease Length of Stay

- Safest place is out of the shelter!
- Managed intake
- Foster homes
- Intake diversion
- Eliminate hold periods for juveniles
- Remove standard intake quarantines
- Institute daily rounds and pathway planning

“Standard” Intake Quarantines

- Challenge the status quo
- True quarantine is achieved by housing animals in a secure environment in “all-in, all-out” fashion
- Reality in shelters is “trickle-in, trickle-out”
- Expose each animal to a larger number of animals
- Limit use to high-risk animals

Multiple Methods of Prevention



Diagnosis

- Symptoms and history
- In-house canine parvovirus ELISA tests
  - Can have false negatives
  - Trust a positive in symptomatic animals
  - Can be used for FPV as well as CPV
- CBC or blood smear
- PCR testing at reference laboratory
- Necropsy

Myth: Testing every dog will prevent parvo

- High predictive value when used on symptomatic animals
- Can be helpful to screen very high-risk individuals, like littermates of affected animals
- Frequency of **FALSE POSITIVES** increases when testing animals without clinical signs that are not high-risk
- Resource-intensive strategy
- Not recommended

Disease response

Positive test – now what?

- Population Response
  - Risk Assessment
  - Decontaminate
  - Clean Break
  - Outbreak Response
- Individual Response

What is an outbreak?

- Greater number of cases of a particular disease than normally expected
- Significant increase in severity of clinical signs

Outbreak Management

- **Diagnosis and Isolation:** Isolate all sick dogs
  - Incubation time = 3-14 days
  - Shedding or contagious time = up to 14 days after recovery
  - Bathe thoroughly when moving out of isolation
  - Do not isolate or house with cats/kittens
- **Identification and Management of Exposed Animals:**
  - Quarantine all exposed high risk dogs for 2 weeks
- **Environmental Decontamination:**
  - Must use a parvocidal disinfectant (not a quat)
- **Protection of Newly Admitted Animals:** Prevent exposure of new dogs to sick dogs and dogs already exposed (quarantine population)
- **Documentation and Communication**

Quarantine vs. Isolation

- **Isolation** = physical separation of infected/symptomatic animals from the general population
- **Quarantine** = physical separation of susceptible animals that have been exposed to an infectious disease but are not yet symptomatic or infected.
- Quarantine period = incubation period
  - 14 days for parvoviruses
  - **Reset quarantine clock to zero any time another animal tests positive and moves to isolation**

Practical considerations

- Segregate clinically ill animals immediately
- Revaccinate all asymptomatic animals
- Strictly adhere to cleaning protocols (ensure parvocidal products in use!)
- Establish rational traffic patterns
  - Healthy to vulnerable
  - Young to old
  - Clinically ill animals have their own staff whenever possible
- Provide PPE to care staff – dedicated boots, not footbaths
- Consider stopping intake

Quarantine challenges

- Strain on housing capacity
- Strain on capacity for care
  - Strict biosecurity
- Concerns for deterioration of behavioral health and welfare for animals held in shelter quarantine
  - Impacts their potential for a live release
- Risk assessment is a humane and cost-effective strategy to quickly move animals out of quarantine

Risk Assessment

Very Low Risk

- Adult, fully vaccinated dogs

Low Risk

- Adults and puppies greater than 5 months old with vaccine on board for 7 days prior to exposure

Moderate Risk

- Vaccinated puppies under 5 months of age

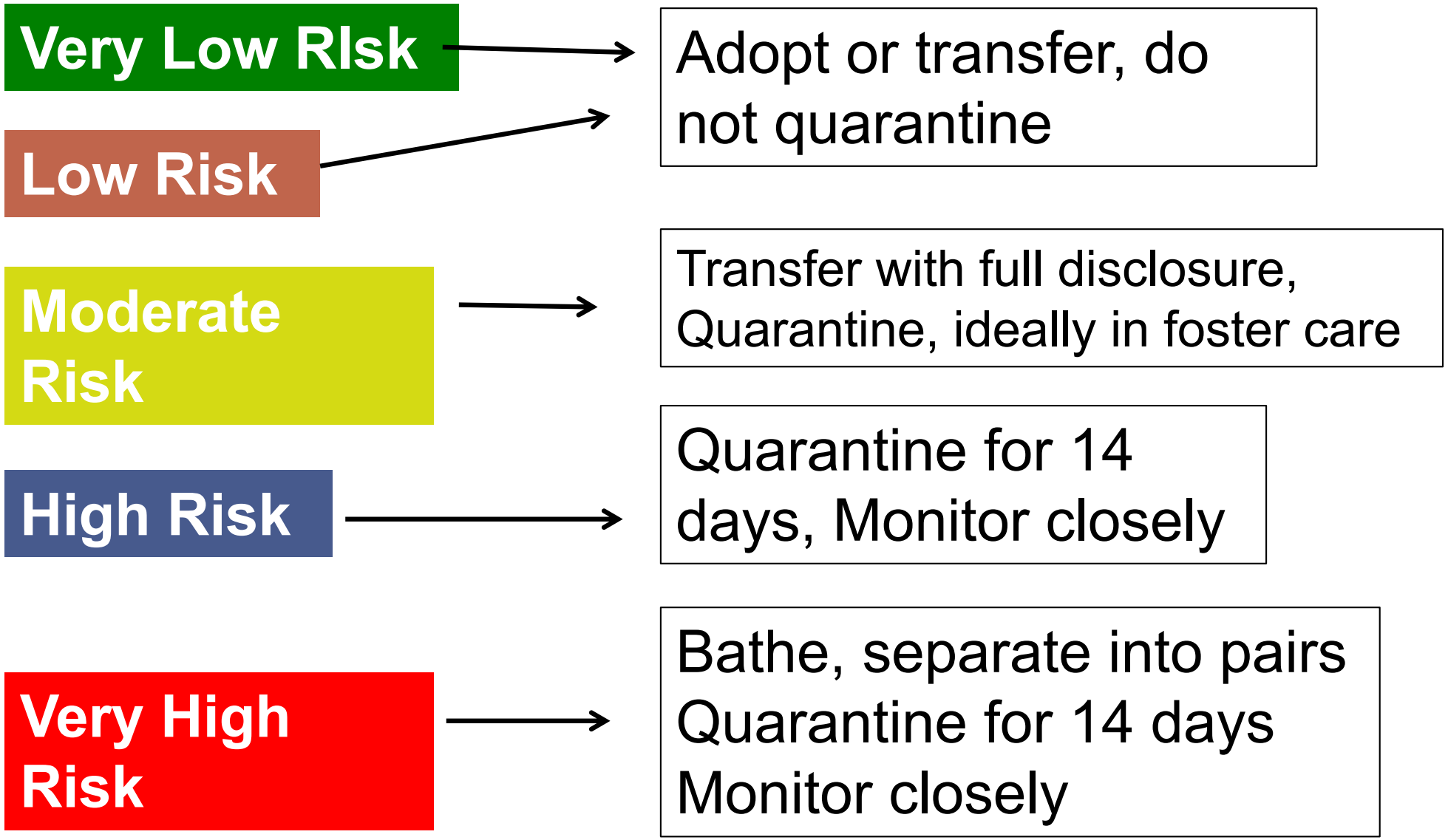
High Risk

- All unvaccinated puppies and dogs or those with vaccine on board less than 7 days

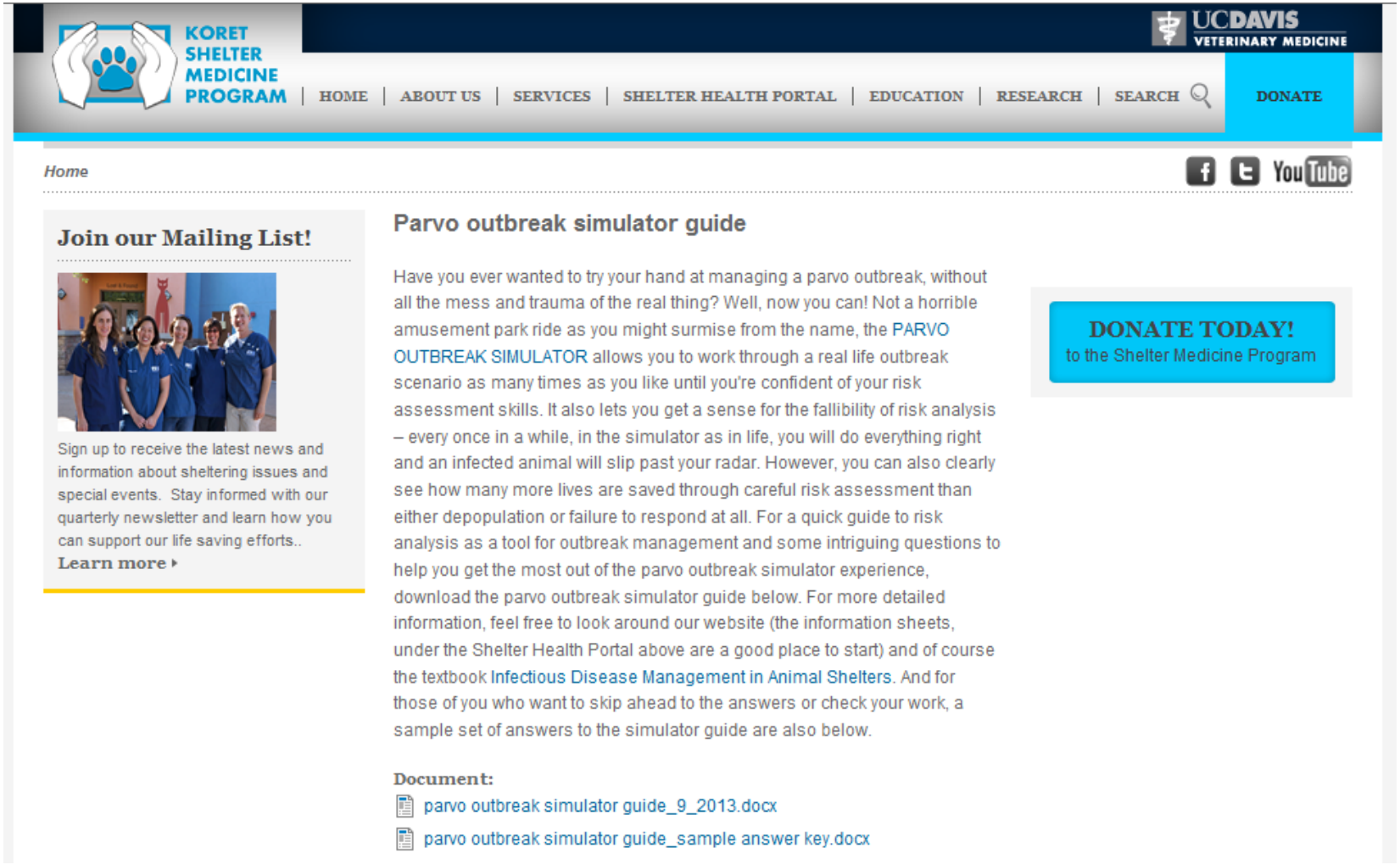
Very High Risk

- Littermates of affected animals

Action Steps for exposed animals



Parvo outbreak simulator



http://sheltermedicine.com/documents/parvo-outbreak-simulator-guide

Money		Rescue		Quarantine	
Money Spent	0	Num Rescue Slots	0	Num Quarantine Cages	10
Available Funds	300	Used Rescue Slots	0	Used Quarantine Cages	0

Patient	Date Arrived	Signalment	Clinical Signs	SNAP Test	Antibody Titer	Action	Correct Action	Animal Status
Case 1	12/27	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 2	12/29	Puppy	GI Signs	Run Test $15	Run Test $15	SELECT		
Case 3	1/8	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 4	12/27	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 5	1/4	Adult	GI Signs	Run Test $15	Run Test $15	SELECT		
Case 6	12/27	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 7	1/6	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 8	1/6	Puppy	Healthy	Run Test $15	Run Test $15	SELECT		
Case 9	12/26	Puppy	Healthy	Run Test $15	Run Test $15	SELECT		
Case 10	1/9	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 11	1/6	Adult	GI Signs	Run Test $15	Run Test $15	SELECT		
Case 12	1/9	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 13	1/7	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 14	12/22	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 15	12/26	Adult	Healthy	Run Test $15	Run Test $15	SELECT		
Case 16	1/9	Puppy	GI Signs	Run Test $15	Run Test $15	SELECT		
Case 17	12/28	Adult	Healthy	Run Test $15	Run Test $15	SELECT		

Behavioral vs. Physical Health

Frequency of CPV Infection in Vaccinated Puppies that Attended Puppy Socialization Classes

Meredith E. Stepita, DVM*†, Melissa J. Bain, DVM, DACVB, MS, Philip H. Kass, PhD, DVM, DACVPM

ABSTRACT

Socialization is one method of preventing behavior problems in dogs; however, some oppose socialization before 16 wk of age due to the risk of contracting infectious diseases. The objectives of this study were to determine if puppies that attended puppy socialization classes and were vaccinated by a veterinarian at least once were at an increased risk of confirmed canine parvovirus (CPV) infection compared with puppies that did not attend classes and to determine the frequency of suspected CPV infection in puppies vaccinated at least once that attended classes with trainers. Twenty-one clinics in four cities in the United States provided information regarding demographics, vaccination, CPV diagnosis, and class attendance for puppies ≤ 16 wk of age. In addition, 24 trainers in those same cities collected similar information on puppies that attended their classes. In total, 279 puppies attended socialization classes and none were suspected of or diagnosed with CPV infection. Results indicated that vaccinated puppies attending socialization classes were at no greater risk of CPV infection than vaccinated puppies that did not attend those classes. (*J Am Anim Hosp Assoc* 2013; 49:95–100. DOI 10.5326/JAAHA-MS-5825)

"Results indicated that vaccinated puppies attending socialization classes were at no greater risk of CPV infection than vaccinated puppies that did not attend those classes."

Treatment

- Supportive Care
  - Treat dehydration, hypoglycemia
  - Prevent sepsis
  - Provide antiemetics, pain relief, and nutrition
- Options for treatment – on-site, off-site clinic, foster home, transfer partner
- Monitoring is key! Status can change rapidly
- More evidence to support outpatient based therapy – prognosis is similar

New Protocol Gives Parvo Puppies a Fighting Chance When Owners Can't Afford Hospitalization

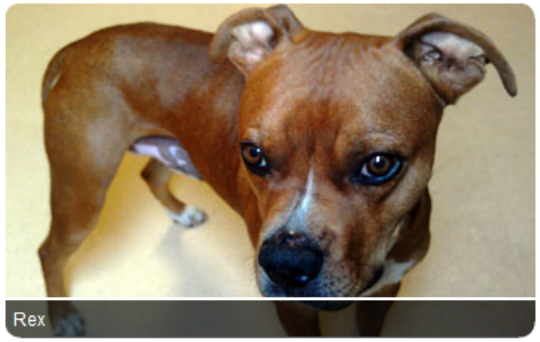
Canine parvovirus is a serious and often fatal viral illness that most commonly affects puppies, though unvaccinated adult dogs can be infected as well. While treatment for parvovirus is available, it can be cost prohibitive for many families. Now, a new protocol developed at the Colorado State University Veterinary Teaching Hospital may help save "parvo puppies" and give their families a chance to give their dogs a healthy life.


Vacita

"Parvovirus is one of the most common and deadliest viruses that unvaccinated dogs tend to get," said Dr. Lauren Sullivan, an Assistant Professor in the Department of Clinical Sciences and a veterinarian with the Critical Care Unit at the Veterinary Teaching Hospital. "While a vaccine is available, puppies can be exposed to the disease before their vaccinations are complete, or if they haven't received puppy wellness care due to their owner's financial limitations."

Parvovirus, which is spread through exposure to feces from infected dogs, has a wide range of symptoms including lethargy, vomiting, fever, and diarrhea. It primarily impacts the gastrointestinal tract and the circulatory system, where it suppresses the bone marrow and causes the white blood cell count to drop. Veterinary care focuses on supporting the puppy with IV fluids and antibiotics, and close monitoring, while the puppy weathers the viral storm. Without intensive veterinary intervention, parvovirus is almost always fatal due to dehydration and/or a severely compromised immune system.

Intervention, while effective, requires inpatient care ranging from $1,500 to $3,000 – a cost some owners simply can't afford. Euthanasia often becomes the only other option for severely affected dogs.

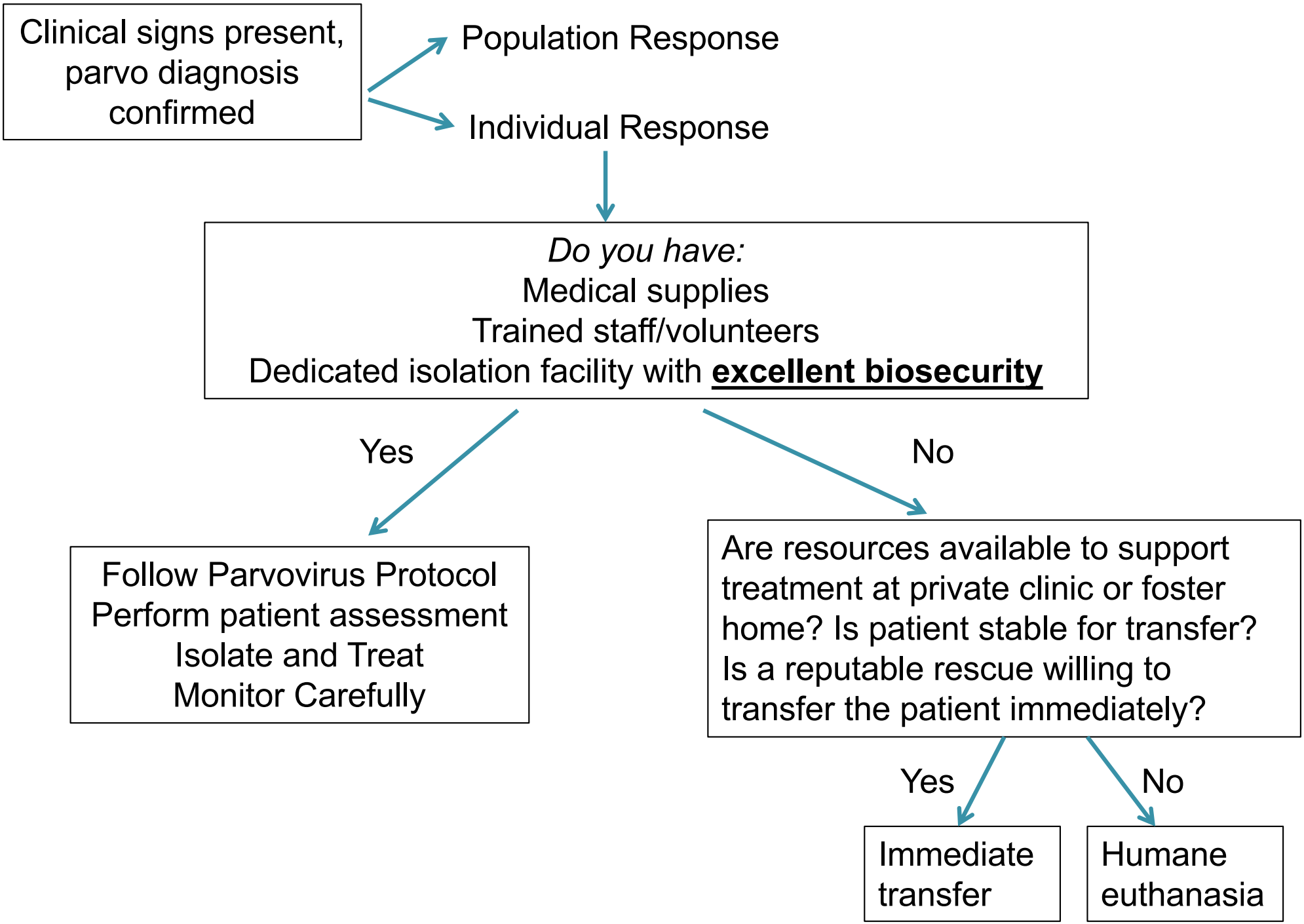

Rex

CSU researchers are showing that there is another possibility – intensive at-home care at a fraction of the cost ($200-$300), but with similar outcomes when compared to the inpatient "gold standard" of care. The treatment relies on two drugs recently released by Pfizer Animal Health (which funded the CSU parvovirus study): Maropitant, a strong anti-nausea medication given under the skin once a day; and Convenia, an antibiotic given under the skin once, and lasting two weeks; as well as administration of fluids under the skin three times daily.

"Rather than being hospitalized, our research shows that puppies can be successfully treated with a protocol that can be replicated at home," said Dr. Sullivan. "We still recommend inpatient care as the best practice, but in some cases that simply isn't financially possible."

The study, which began June 4, was conducted by Drs. Sullivan, David Twedt, Pedro Boscan, Emilee Venn (a resident in critical care); Karolina Preisner (student coordinator), and veterinary students interested in the research experience. The study was advertised to veterinarians in the greater Colorado community, who referred cases from their practices. A total of 40 dogs were admitted to the study group, randomized to one group that received traditional gold standard care and one group that received the at-home protocol.

http://csu-cvmbs.colostate.edu/pages/parvo-puppies-new-protocal.aspx


Clinical signs present, parvo diagnosis confirmed
Population Response
Individual Response
Do you have:
Medical supplies
Trained staff/volunteers
Dedicated isolation facility with **excellent biosecurity**
Yes
No
Follow Parvovirus Protocol
Perform patient assessment
Isolate and Treat
Monitor Carefully
Are resources available to support treatment at private clinic or foster home? Is patient stable for transfer? Is a reputable rescue willing to transfer the patient immediately?
Yes
No
Immediate transfer
Humane euthanasia

Isolation space

- Ideally, physically separate building, or at least restricted access
- At minimum, must be separate, easily disinfected area with dedicated equipment
- Sufficient staffing for monitoring and care is mandatory
- PPE – full body protection, boots, gloves, ideally separate staff
- No crossover with juveniles and new intakes

Post-treatment, now what?

- Follow your protocol
  - Clinical signs have resolved, Negative ELISA test
- Thorough bathing, including toenails!
- Move ‘em out!
- What about vaccination?
  - Return to regular vaccination schedule as soon as completely recovered from clinical signs

Communication is Key

- All staff, volunteers, foster parents should be well educated
- Counsel adopters!

INFO FOR NEW DOG ADOPTERS - -PARVOVIRUS-

WHAT YOU SHOULD KNOW ABOUT CANINE PARVOVIRUS

Congratulations on your new dog! The shelter staff has worked very hard to ensure the health of your dog but with so few animals vaccinated in our community, the chance for spreading disease amongst our pets is increased--especially in shelters where large numbers of animals are housed. Canine Parvovirus, or Parvo as it's more commonly known, is sometimes found in in dogs adopted from shelters. Parvo is a very serious and contagious disease so please familiarize yourself with the following information.

Did you know?...

- Parvo is HIGHLY contagious and potentially fatal to "at risk" dogs --puppies under ten months old and dogs that have not been vaccinated are most at risk.
- Parvo generally affects the dog's intestinal tract and in rare cases, the heart. *Symptoms of Parvo can include bloody diarrhea, depression, fever, eventual dehydration, loss of appetite and lethargy.*
- Parvovirus is transmitted through the feces and vomit of infected dogs. Parvo is VERY hardy and can live on some surfaces for many months. It can easily be spread from dog to dog via "carriers" called fomites like the hands, shoes or clothing of anyone who comes into contact with the virus.
- Like many pet illnesses, Parvovirus can have a lengthy incubation period and animals may be harboring the disease. This means the pet may have contracted the disease and appear perfectly healthy until the symptoms suddenly appear.

When should you seek treatment?

- You should always take your new dog to a veterinarian within 2 days of adoption, for a routine health check. However, if any of your dogs develop bloody diarrhea, fever, lethargy or loss of appetite, you should make an appointment with a veterinarian immediately.

Can Canine Parvovirus be prevented?

YES! Regular vaccinations are KEY to prevention and puppies especially need to see a veterinarian to protect them from this serious and potentially deadly disease. *Remember, there is NO cure for Canine Parvovirus. Your dog MUST be vaccinated against Parvo to prevent them from getting this deadly disease.* Regular vaccinations are the best way to ensure your dog leads a happy, healthy life. Call Animal Care Services at 207-4PET for info on low cost vaccination resources.

ACS
CITY OF SAN ANTONIO
ANIMAL CARE SERVICES
4710 State Highway 151
San Antonio, Texas 78227
207-4PET

www.SALicenseYourPet.com
www.SALicenciaSuMascota.com

Take home points

- Parvovirus is a continual threat
- Prevention through vaccination, sanitation, monitoring and population management
- Vaccines and diagnostics are effective for CPV-2c
- Perform risk assessment on exposed animals
- Carefully consider capacity to treat
- Routine testing may yield false positives and drain resources
- Eliminate intake quarantines in high volume facilities

Excellent Resources

www.sheltermedicine.com

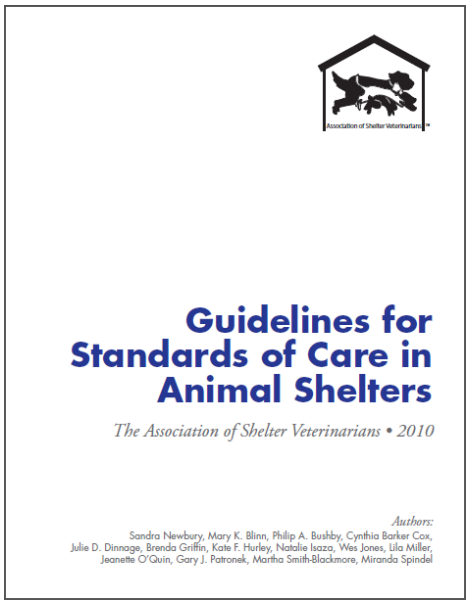
www.sheltermedicine.vetmed.ufl.edu

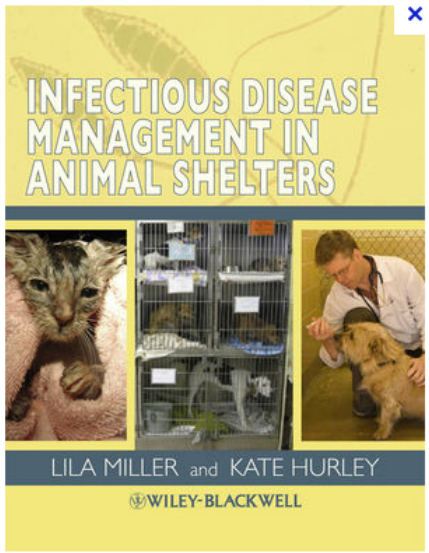
www.animalsheltering.org

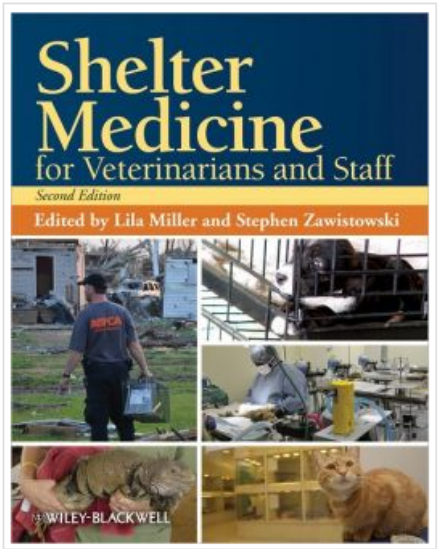
www.maddiesinstitute.org

www.sheltervet.org

www.aspcapro.org







Questions?

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