### Vaccine Types

**Infectious Vaccines**
- Infect the host’s cells to produce additional antigen
  - modified-live [attenuated]
    - Bordetella bronchiseptica
    - Coronavirus
    - Distemper
    - Measles
    - Parovirus
    - Adenovirus-2
    - Parainfluenza

**Noninfectious Vaccines**
- Incapable of infecting the host’s cells to produce additional antigen
  - killed [inactivated]
    - Bordetella bronchiseptica
    - Coronavirus
    - Rabies
    - Influenza
    - Lyme
    - Leptospira
    - Crotalus atrox
Key Clinical Differences

> 16 weeks old

<table>
<thead>
<tr>
<th></th>
<th>Infectious Vaccines</th>
<th>Noninfectious Vaccines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial doses needed to immunize</td>
<td>Only one dose</td>
<td>Two doses (2-6 wks apart)</td>
</tr>
<tr>
<td>Initial dose to onset of immunity</td>
<td>Within days</td>
<td>At least one week after 2nd dose</td>
</tr>
<tr>
<td>Duration of immunity</td>
<td>Multiple years</td>
<td>About one year</td>
</tr>
</tbody>
</table>

Rabies vaccination is special:
- Noninfectious, but only 1 dose recommended
- Initial dose onset to immunity set by law
- Duration of immunity set by law

Puppy CORE Vaccines

- MLV or r’Distemper
- MLV Parvovirus
- MLV Adenovirus-2
- Rabies 1-year

Every 3-4 weeks
<table>
<thead>
<tr>
<th>Last Dose</th>
<th>6 weeks</th>
<th>7 weeks</th>
<th>8 weeks</th>
<th>9 weeks</th>
<th>10 weeks</th>
<th>11 weeks</th>
<th>12 weeks</th>
<th>13 weeks</th>
<th>14 weeks</th>
<th>15 weeks</th>
<th>16 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booster within 1 year</td>
<td></td>
<td></td>
<td></td>
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MINIMUM recommended interval between doses of vaccine is 2 WEEKS

Regardless of the Antigen
Booster Interval in Adult Dogs

- Canine Distemper (MLV and recombinant)
- Parvovirus (MLV)
- Adenovirus-2 (MLV)

...may be administered at intervals of every 3 years or greater, regardless of the product used.

The USDA allows manufacturers to include duration of immunity (DOI) data on the vaccine label (see product package insert).

Veterinarians have discretion in the selection and use of vaccines.

Canine NON-CORE Vaccines

- Lyme (Non-infectious)
- Leptospirosis (Non-infectious)
- Bordetella bronchiseptica (Both)
- Parainfluenza (Infectious)
- Canine Influenza (Non-infectious)
- Crotalus atrox (Non-infectious)

Adult Initial Vaccination for Noninfectious Non-Core vaccines: 2 doses, 2-4 weeks apart

Booster: annual, if exposure risk is sustained

Not Recommended: Coronavirus
Leptospirosis

In the beginning...

- there were 2...
  - *L. canicola* and *L. icterohemorragiae*
- and then, there were 4...
  - *L. pomona* and *L. grippotyphosa*
- and then, there were more???
  - *L. bratislava* and *L. autumnalis*

Vaccine Adverse Events
Vaccine Adverse Events

- Lumps and Lethargy and Transient Pain/Discomfort
- Failure to Immunize
- Hypersensitivity
  - Type 1
  - Type 2
  - Type 3
  - Type 4
- Tumorigenesis (Injection Site Sarcoma)
- Transient Immune Suppression
- Inappropriate Administration of Vaccine
- Residual Virulence of an Attenuated (MLV) Vaccine
- Vaccine-Induced Interference with Diagnostic Tests
- Multisystemic Inflammatory Disorder of Weimaraners
- Reversion to Virulence-MLV vaccine only (rare)

Manufacturer

USDA Center for Veterinary Biologics
CFIA Centre for Veterinary Biologics

Reporting Suspected Adverse Events

Vaccines are BIOLOGICAL AGENTS therefore:

“...veterinarians are encouraged to inform clientele that their pet, regardless of breed or size, may manifest transient side effects for up to 2, and possibly 3, days after administration of any vaccine or any combination of vaccines.”
Failure to Immunize

Small Breed dogs that receive multiple doses of vaccine at the same appointment may be at increased risk of an acute-onset adverse event.
“Mitigating risk in small dogs (puppies and small breeds) by reducing the volume of vaccine is not recommended.”

In Small Breed dogs, it is recommended to delay administration of NON-core vaccines until at least 2 weeks following completion of the initial series of core vaccinations.
Serologic Testing

- Valid for Core Vaccines (CDV, CPV-2, CAV-1, RV*) Only
- Reference Labs & two USDA-approved In-hospital Tests
  
Applications
- History of possible vaccination-related adverse event
- Verify effectiveness of puppy core vaccine series
- Evaluate persistence of immunity after 3 year interval

Legal Considerations

Veterinarians have considerable ability to use biologics in a discretionary manner. Relative risk for utilizing these guidelines in developing patient vaccination protocols is considered low.

There is no reason to believe that decisions regarding vaccine selection and use will carry any greater legal risk than the myriad of other medical decisions made in daily practice.

The best method for insulating a practitioner from legal liability relative to vaccination or anything else is effective client communication.

FAQ Tidbits

The adverse reaction risk associated with a vaccine may persist substantially longer than the protective immune response.

MLV vaccines should be discarded if kept at room temperature for 1 hour or longer after reconstitution.

If a second dose of a noninfectious vaccine is not given within 6 wk of the first, two additional doses, administered 2 to 6 wk apart, are recommended. Rabies vaccine is the exception once again.
Please read the guidelines for more fun with canine vaccinations.

THANK YOU.

Questions to the Speakers
Please email your questions to webconference@aahanet.org by Sunday, November 27, 2011.

Dr. Welborn will provide written responses to all of the questions and they will be posted on AAHA’s website by Friday, December 9, 2011.

AAHA gratefully acknowledges Boehringer Ingelheim Vetmedica, Merck Animal Health, Merial, and Pfizer Animal Health for their sponsorship of this webcast.

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Thank you for your participation!