Background

Diarrhoea is a common problem in companion animals. Identifying infectious causes of diarrhoea is an important component of the diagnostic workup, but it is often overlooked. Performing fecal ova and parasite screens and supplementary Giardia testing is fairly routine, but rarely are additional diagnostic tests performed to identify infectious causes of diarrhoea. This may in part be because traditional methods for identifying gastrointestinal infections have been expensive, of low diagnostic sensitivity and slow to yield results. It is common for dogs and cats to be treated with broad spectrum anthelmintic and antibiotic therapies. If diarrhoea persists, infectious causes are considered unlikely and dietary trials and symptomatic treatment is often pursued. If this approach is unsuccessful, intestinal biopsies may be obtained in some cases in an attempt to yield a definitive diagnosis that may lend itself to specific treatment.

Treatment failure with persistent or recurrent diarrhoea, lack of a definitive diagnosis and expense of ineffective medications can lead to client dissatisfaction and noncompliance as well as jeopardize the pet’s health.

IDEXX Diarrhoea RealPCR Panels

The IDEXX diarrhoea RealPCR panels allow you to screen for multiple infectious causes of diarrhoea from a single fecal sample. These panels offer a comprehensive tool to identify common intestinal pathogens to help you more quickly and accurately identify the infectious agents that may be contributing to diarrhoea in your patients.

The panels are specifically designed for dogs and cats, and they detect the most likely infectious causes of diarrhoea in each species. These diarrhoea panels can be used to complement your routine fecal tests (e.g., fecal ova and parasite screen and SNAP® Giardia Test in dogs and cats with diarrhoea). The diarrhoea panels are not intended to be used as a screening tool in healthy pets except in a shelter-type environment for surveillance.

The canine diarrhoea panel includes RealPCR tests for Giardia spp., Cryptosporidium spp., Salmonella spp., Clostridium perfringens enterotoxin A gene, canine enteric coronavirus, canine parvovirus 2 and canine distemper virus.

The feline diarrhoea panel includes RealPCR tests for Tritrichomonas foetus, Giardia spp., Cryptosporidium spp., Toxoplasma gondii, Salmonella spp., Clostridium perfringens enterotoxin A gene, feline coronavirus (FeCoV) and feline panleukopenia virus.

Interpreting Results

Results of IDEXX diarrhoea RealPCR panels should be interpreted in light of patient signalment, history, clinical presentation, vaccination history and other laboratory data. For example, a positive parvovirus PCR test result in a 3-month-old puppy with acute onset of vomiting, bloody diarrhoea and leukopenia is very diagnostic for parvovirus enteritis. However, a positive coronavirus PCR test result in a 5-year-old well-vaccinated dog with chronic intermittent diarrhoea, a good appetite and otherwise clinically healthy is likely an incidental finding, and further diagnostics to determine the etiology of the diarrhoea should be considered. This dog, however, may be chronically shedding coronavirus and may be a source of infection for other dogs.

The chart on the following page contains a list of the fecal pathogens in the IDEXX Canine and Feline Diarrhoea RealPCR Panels and summarizes the following for each pathogen: the common clinical signs, the prevalence reported in the literature, the prevalence from diarrhoea RealPCR panels submitted over a 5-month period, the clinical significance including zoonotic potential, additional diagnostic tests that should be considered when this organism is identified and treatment recommendations. It is interesting to point out that the prevalence data from the literature for most organisms is similar to the IDEXX RealPCR prevalence data. Differences may stem from the animal populations studied and the diagnostic tests used to detect the pathogen in these studies.

When to Use IDEXX Diarrhoea RealPCR Panels

1. To identify the pathogen(s) that may be causing or contributing to diarrhoea in dogs and cats
2. To support timely diagnosis and initiation of appropriate therapy
3. As a surveillance tool for dog or cat populations (e.g., shelters, breeding facilities)
4. To identify and minimize human exposure to zoonotic pathogens
<table>
<thead>
<tr>
<th>Organism</th>
<th>Species Affected</th>
<th>Clinical Signs</th>
<th>Prevalence (in literature)</th>
<th>IDEXX RealPCR Prevalence</th>
<th>Clinical Significance</th>
<th>Additional Diagnostics Recommended</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| **Clostridium perfringens** Enterotoxin A Gene** | Dog, Cat         | • Acute/chronic/intermittent small- and/or large-bowel diarrhoea  
• Canine nosocomial diarrhoea  
• Hemorrhagic diarrhoea (e.g., HGE) in dogs  | • 7%–14% in nondiarrheic dogs\(^2\)  
• 41% in diarrheic dogs\(^2\)  | 39% in dogs  
37.8% in cats  | • Detection is likely significant  
• No zoonotic potential | Strengthen significance of a positive *C. perfringens* enterotoxin A gene PCR test result by *C. perfringens* enterotoxin by ELISA\(^27\) | Ampicillin/amoxicillin  
Metronidazole  
Tylosin  
Resistance to tetracyclines  
High-fiber diet |
| **Salmonella spp.** Gram-negative bacteria | Dog, Cat         | • Fever/sepsis  
• Anorexia, diarrhoea (may or may not be hemorrhagic), vomiting, weight loss  | • 0%–1.9% in nondiarrheic animals\(^3\)  
• 0%–1.4% in diarrheic animals\(^3\)  | 0.1% in dogs  
0.4% in cats  | • Detection is likely significant  
• Zoonotic potential |  | Controversial  
Only if systemic illness  
Based on sensitivity sting  
Fluoroquinolones, chloramphenicol, trimethoprim-sulfa and amoxicillin |
| **Cryptosporidium spp.** Coccidia | Dog, Cat         | • Acute/chronic/intermittent small- and/or large-bowel diarrhoea  | • 7.3% in kittens\(^4\)  
• 4.7% in shelter cats\(^5\)  
• 3%–10% PCR prevalence in dogs\(^6\)  | 6% in dogs  
5.4% in cats  | • Detection is significant  
• Zoonotic potential | Culture and sensitivity | Treatment often ineffective  
Azithromycin  
Tylosin  
Paromycin (caution: nephrotoxicity)  |
| **Giardia spp.** Protozoon | Dog, Cat         | • Acute/chronic/intermittent small- and/or large-bowel diarrhoea  | • Overall 8% in dogs\(^7\)  
• 36%–50% in puppies\(^7\)  
• Up to 100% in dogs in shelters and kennels\(^7\)  
• Overall 4% in cats\(^7\)  
• 9.8% in shelter cats\(^7\)  
• 31% in purebred cattry cats\(^7\)  
• 31% in purebred cattry cats\(^7\) | 8.3% in dogs  
5.1% in cats  | • Detection is significant  
• Zoonotic potential |  | Fenbendazole  
Febantel-praziquantel-pyrantel (Drontal\(^\text{®}\) Plus)  
Metronidazole (less effective) |
| **Trichomonas foetus** Protozoon | Cat             | • Chronic or recurrent large-bowel diarrhoea  | • 31% in purebred cattry cats\(^7\)  
• 14.4% of cats with diarrhoea in UK\(^7\) | 9.2% in cats |  |  | Ronidazole\(^12\) |
### Toxoplasma gondii

*Coccidia*

<table>
<thead>
<tr>
<th>Cat</th>
<th>Dog</th>
<th>Cat</th>
<th>Dog</th>
<th>Cat</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Usually asymptomatic</td>
<td>• Clinical signs typically mild without coinfection</td>
<td>• Convalescent enteritis</td>
<td>• Transient, mild diarrhoea, vomiting</td>
<td>• Acute anorexia, diarrhoea (may or may not be hemorrhagic), vomiting, dehydration</td>
<td>• Acute anorexia, vomiting, dehydration with or without diarrhoea</td>
</tr>
<tr>
<td>• Self-limiting small-bowel diarrhoea possible</td>
<td>• Acute diarrhoea, sometimes preceded by vomiting</td>
<td>• Feline infectious peritonitis (FIP): fever, weight loss, inappetance</td>
<td>• Fever/sepsis</td>
<td>• Fever/sepsis</td>
<td>• Mild</td>
</tr>
<tr>
<td></td>
<td>• Presence or absence of fever</td>
<td>• Noneffusive: granulomatous gastroenteritis possible with constipation, chronic diarrhoea, vomiting, uveitis; neurologic signs, etc.</td>
<td>• Effusive: pleural effusion/ascites</td>
<td></td>
<td>– Respiratory: coughing, ocuonal discharge</td>
</tr>
</tbody>
</table>

0.9% of feline fecal samples<sup>13</sup>  
15%–26% family pets<sup>4</sup>  
59.3% in nondiarrheic shelter dogs<sup>10</sup>  
73.3% in diarrheic shelter dogs<sup>15</sup>

<table>
<thead>
<tr>
<th>Cat</th>
<th>Dog</th>
<th>Cat</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Detection may not be significant&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>• Detection may not be significant&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Zoonotic risk high for pregnant women</td>
<td>• No zoonotic potential</td>
<td>• Likely not cause of diarrhoea</td>
<td>• No zoonotic potential</td>
</tr>
<tr>
<td>• Zoonotic risk for immunocompromised individuals</td>
<td>• No zoonotic potential</td>
<td>• May indicate chronic carrier</td>
<td>• No zoonotic potential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No zoonotic potential</td>
<td></td>
</tr>
</tbody>
</table>

0.5% in cats  
10.6% in dogs  
60.2% in cats  
3.5% in dogs  
3.2% in cats  
1.2% in dogs

<table>
<thead>
<tr>
<th>IgG and IgM ELISA if extraintestinal signs present</th>
<th>CBC: leucopenia common</th>
<th>CBC: leucopenia common</th>
<th>CBC: lymphopenia common</th>
<th>Chest radiographs if respiratory signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To detect chronic shedders, perform FeCoV PCR test on feces weekly for 4 consecutive weeks&lt;sup&gt;17&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If FIP suspected, a positive, FeCoV PCR test result on ascites or pleural fluid, whole blood or tissues supports diagnosis</td>
<td></td>
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<td></td>
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<p>| | | | | |</p>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Clindamycin (preferred)</td>
<td>• Supportive</td>
<td>• Rarely indicated for gastrointestinal signs</td>
<td>• Supportive</td>
<td></td>
</tr>
<tr>
<td>• Pyrimethamine-sulfonamide combination</td>
<td>• Identify and treat secondary or concurrent infections</td>
<td>• No effective treatment for FIP; supportive care</td>
<td>• Treat secondary infections</td>
<td></td>
</tr>
</tbody>
</table>

**Toxoplasma gondii** infections  
Infections in the bloodstream can cause mild fever, myalgia, myoclonus, ataxia.

**Canine Enteric Coronavirus**  
RNA virus

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<thead>
<tr>
<th>0.5% in cats</th>
<th>10.6% in dogs</th>
<th>60.2% in cats</th>
<th>3.5% in dogs</th>
<th>3.2% in cats</th>
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</table>

**Feline Coronavirus (FeCoV)**  
RNA virus

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<tr>
<th>CBC: leucopenia common</th>
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<th>CBC: lymphopenia common</th>
<th>Chest radiographs if respiratory signs</th>
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<td></td>
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<tr>
<td>• If FIP suspected, a positive, FeCoV PCR test result on ascites or pleural fluid, whole blood or tissues supports diagnosis</td>
<td></td>
<td></td>
<td></td>
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**Canine Parvovirus 2**  
DNA virus

<table>
<thead>
<tr>
<th>Cat</th>
<th>Dog</th>
<th>Cat</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Acute anorexia, diarrhoea (may or may not be hemorrhagic), vomiting, dehydration</td>
<td>• Acute anorexia, vomiting, dehydration with or without diarrhoea</td>
<td>• Fever/sepsis</td>
<td>• Fever/sepsis</td>
</tr>
</tbody>
</table>

**Feline Panleukopenia Virus**  
DNA virus

**Canine Distemper Virus**  
RNA virus

<table>
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<tr>
<th>Cat</th>
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<th>Cat</th>
<th>Dog</th>
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<td>• Acute anorexia, vomiting, dehydration with or without diarrhoea</td>
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**Canine Enteric Coronavirus** infections  
Infections in the bloodstream can cause mild fever, myalgia, myoclonus, ataxia.

**Feline Coronavirus (FeCoV)** infections  
Infections in the bloodstream can cause mild fever, myalgia, myoclonus, ataxia.

**Canine Parvovirus 2** infections  
Infections in the bloodstream can cause mild fever, myalgia, myoclonus, ataxia.

**Feline Panleukopenia Virus** infections  
Infections in the bloodstream can cause mild fever, myalgia, myoclonus, ataxia.

**Canine Distemper Virus** infections  
Infections in the bloodstream can cause mild fever, myalgia, myoclonus, ataxia.

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<sup>a</sup> Vaccination with a modified live vaccine may result in positive results for up to a few weeks post vaccination.  
<sup>b</sup> IDEXX RealPCR prevalence data from a total number of 918 samples for dogs and 944 samples for cats collected over a 5-month time frame.  
<sup>c</sup> Detection is likely significant: The organism may be the cause of the clinical signs, contributing to the clinical signs or may indicate carrier state.  
<sup>d</sup> Detection is significant: The organism is likely the cause of the gastrointestinal signs.  
<sup>e</sup> Detection may not be significant: The organism is not likely the cause of the gastrointestinal signs.  
<sup>f</sup> Test best performed on a fresh sample.
Contacting IDEXX Laboratory Customer Support

Expert Feedback When You Need It

If you have any questions regarding test codes, turnaround times or pricing, please contact our Laboratory Customer Support Team at 1300 44 33 99.

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5. Shukla R, Giraldo P, Kruliz A, Finnigan M, Sanchez AL. spp. and other zoonotic enteric parasites in a sample of domestic dogs and cats in the
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11. Dabritz HA, Miller MA, Atwill ER, Gardner IA, Leutenegger CM, Melli AC, Conrad PA. Detection of Toxoplasma gondi–like oocysts in cat feces and estimates of the
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