Enterovirus Technical Memo

How to choose a disinfectant product for Enterovirus 68 (EV-D68)?

According to CDC, cleaning and disinfecting frequently touched surfaces can help protect yourself and others from non-polio Enterovirus infections[1].

We do not have testing data against Enterovirus 68 (EV-D68), which is a rare strain of virus. EPA requires testing on the particular strain to be able to make such a claim.

Enterovirus 68 is a large non-enveloped single-stranded RNA virus. According to CDC, environmental disinfection of surfaces in healthcare settings should be performed using a hospital-grade disinfectant with an EPA label claim for any of several non-enveloped viruses (e.g. norovirus, poliovirus, rhinovirus)[2].

Metrex products with Non-enveloped viruses testing data[3,4]

CaviWipes1™ **3** min against Adenovirus II (non-enveloped virus)

CaviCide1™ 3 min against Norovirus, Rotavirus and Adenovirus (non-enveloped viruses)

What are relevant peer-reviewed studies on virus disinfection or Enterovirus?

It should be pointed out that studies have shown that even a subtle change in the genome composition of closely related viruses can yield up to 44 times difference in disinfection kinetics[5]. Virus surrogate has shown distinct disinfection efficacy[6]. So the classification either based on genome composition or envelop/non-envelope structures may not give a reliable prediction of disinfection efficacy on any untested viruses.

Organic matter can greatly affect the activity of a disinfectant either by reducing the effective concentration or by protecting viral particles from detrimental effect. This is particularly relevant in the hospital environment when contamination may be associated with blood, serum, soil, faeces and other organic materials[7].

According to a study, only 2.2% blood contamination on anesthesia equipment is visible[8]. Of 97 clean infant stethoscopes, 80% of labor and delivery and 72% of nursery stethoscopes had organic buildup[9]. Cleaning is a prerequisite to achieve effective disinfection. Choosing a one-step product that can both clean organic soils instead of denaturing/fixing proteins on the surfaces and disinfecting non-enveloped virus is a key.

A study showed that viruses including Enterovirus, norovirus and other strains were detected on 78% of surfaces and in 81% of aerosol. The researchers concluded that toilets are

an important source of viral contamination, mainly in health care settings, where disinfection can have a crucial role in preventing virus spread[10].

Enterovirus Basic Knowledge 101[11]

What is Enterovirus?

Enterovirus is a common respiratory virus. The Centers for Disease Control and Prevention (CDC) estimates 10 to 15 million infections occur in the United States each year.

However, this type of *Enterovirus* -- *Enterovirus* D68, first identified in California in 1962 that has not been commonly reported since then-- appears to be exacerbating breathing problems in children with asthma. From mid-August to September 18, 2014, a total of 153 people in 18 states have been confirmed to have respiratory illness caused by EV-D68 according to CDC[11].

Currently there is no vaccine for EV-D68. Kids with asthma are more prone to Enterovirus.

How does it spread?

Since EV-D68 causes respiratory illness, the virus can be found in an infected person's respiratory secretions such as saliva, nasal mucus, or sputum. Transmission from person to person occurs through coughing, sneezing, or touching of contaminated surfaces.

What are the symptoms?

Most people who are infected with non-polio Enteroviruses do not get sick, or have only mild illnesses. Symptoms of mild illness may include:

- Fever
- Runny nose, sneezing, cough
- Skin rash
- Mouth blisters
- Body and muscle aches

What is the best prevention according to CDC[11]?

- Wash hands often with soap and water for 20 seconds, especially after changing diapers.
- Avoid touching eyes, nose and mouth with unwashed hands.
- Avoid kissing, hugging, and sharing cups or eating utensils with people who are sick.
- Disinfect frequently touched surfaces, such as toys and doorknobs, especially if someone is sick.

References:

1 CDC. *Non-Polio Enterovirus Prevention & Treatment*, <http://www.cdc.gov/non-polio-enterovirus/about/prevention-treatment.html> (2014).

2 CDC. *Severe Respiratory Illness Associated with Enterovirus D68 – Multiple States, 2014*, <http://emergency.cdc.gov/han/han00369.asp> (2014).
3 EPA Pesticide Product Label System, 2012.
4 EPA Pesticide Product Label System, 2012.
5 Sigstam, T. *et al.* Subtle differences in virus composition affect disinfection kinetics and mechanisms. *Applied and environmental microbiology* **79**, 3455-3467, (2013).
6 Meyers, J., Ryndock, E., Conway, M. J., Meyers, C. & Robison, R. Susceptibility of high-risk human papillomavirus type 16 to clinical disinfectants. *The Journal of antimicrobial chemotherapy* **69**, 1546-1550, (2014).
7 Hambidge, A. Reviewing efficacy of alternative water treatment techniques. *Health estate* **55**, 23-25 (2001).
8 Perry, S. M. & Monaghan, W. P. The prevalence of visible and/or occult blood on anesthesia and monitoring equipment. *AANA journal* **69**, 44-48 (2001).
9 Nick, J. M. Organic buildup and residual blood on infant stethoscopes in maternal-infant areas. *Journal of obstetric, gynecologic, and neonatal nursing : JOGNN / NAACOG* **28**, 143-150 (1999).
10 Verani, M., Bigazzi, R. & Carducci, A. Viral contamination of aerosol and surfaces through toilet use in health care and other settings. *American journal of infection control* **42**, 758-762, (2014).
11 CDC. *Enterovirus D68*, <http://www.cdc.gov/non-polio-enterovirus/about/prevention-treatment.html> (2014).