

CONCURRENT SESSION 2 – COVID-19 RESEARCH EFFORTS

Swab and Stick Sponge Sampling for SARS-CoV-2 Detection on Surfaces

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Effective surface sampling of SARS-CoV-2 is important to determine disinfection efficacy or as part of environmental surveillance of surface contamination. This study evaluated the sampling efficiency and limits of detection (LOD) of swab and stick sponge sampling methods for recovering infectious SARS-CoV-2 and viral RNA from surfaces. Swabs or stick sponges were evaluated for virus collection from 6"x6" coupons composed of four materials: stainless steel (SS), ABS plastic (ABS), bus seat fabric, and Formica. SARS-CoV-2 suspended in simulated saliva (1.0 mL final volume) was inoculated dropwise onto each coupon. For each material, multiple spike levels were assessed to determine the lowest level of inoculum to be recovered (limit of detection, LOD). At 0- or 3-hours post-inoculation, coupons were sampled using either Sanigen macrofoam swabs (pre-moistened with Phosphate Buffered Saline) or Hygienea stick sponges (pre-moistened with neutralizing buffer). Swabs were expressed onto the side of a conical tube containing cell culture media and extracted by vortex. Stick sponges were extracted by stomaching in cell culture media. Recovered infectious SARS-CoV-2 was quantified by TCID50 assay on Vero cells by evaluating cytopathic effect after a 5-day incubation at 37°C. Recovered SARS-CoV-2 RNA was also extracted and quantified by RT-qPCR targeting the N1 region of the nucleocapsid gene. Sampling method efficiency was determined by percent recovery of infectious virus or viral RNA from each sample. The relationship between the number of inoculated versus recovered infectious virus particles or genome copies per sampling area was determined using x-y plots. The LOD of each method and material was determined from the quantified infectious virus and viral RNA recovered from all materials at both time points. Porous seat fabric resulted in a higher LOD for both infectious virus and viral RNA compared to the non-porous materials (SS, ABS, Formica). A comparison of both sampling methods as well as efficacy of recovery of infectious virus versus viral RNA will be discussed.
