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Divided on dividers: Real-world assessment of the efficacy of barriers for prevention of aerosol exposure

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Poster #1915

Background

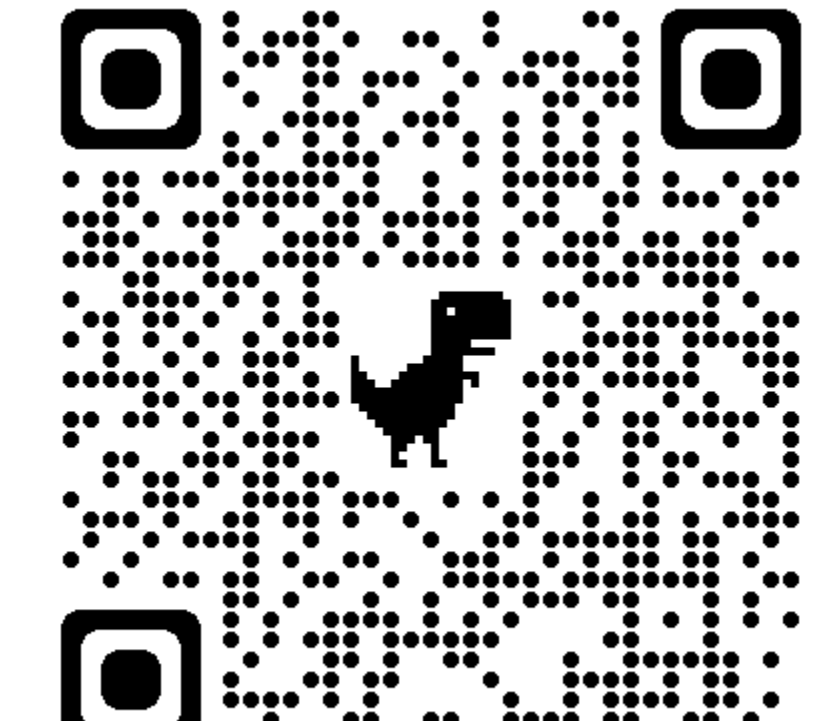
- Barriers are commonly installed in workplaces where physical distancing cannot be maintained to reduce the risk for transmission of respiratory viruses.
- Although some types of barriers have been shown to reduce exposure to aerosols in laboratory-based testing, limited information is available on the efficacy of barriers in real-world settings.

Methods

- In an acute care hospital, we tested the effectiveness of in-use plexiglass dividers in reducing exposure of staff to aerosolized particles.
- An aerosol sprayer was used to release 5% NaCl aerosol at 1 or 2 meters from staff members with and without the barrier positioned between the point of aerosol release and the hospital staff.
- Particle counts on the staff side of the barrier were measured using a 6-channel particle counter.
- A condensed moisture (fog) generating device was used to visualize the airflow patterns.



Preval sprayer



Video of ineffective divider



Condensed moisture device

Results

Figure 1. Illustration of patient interactions with barriers and the barrier efficacy relative to ventilation

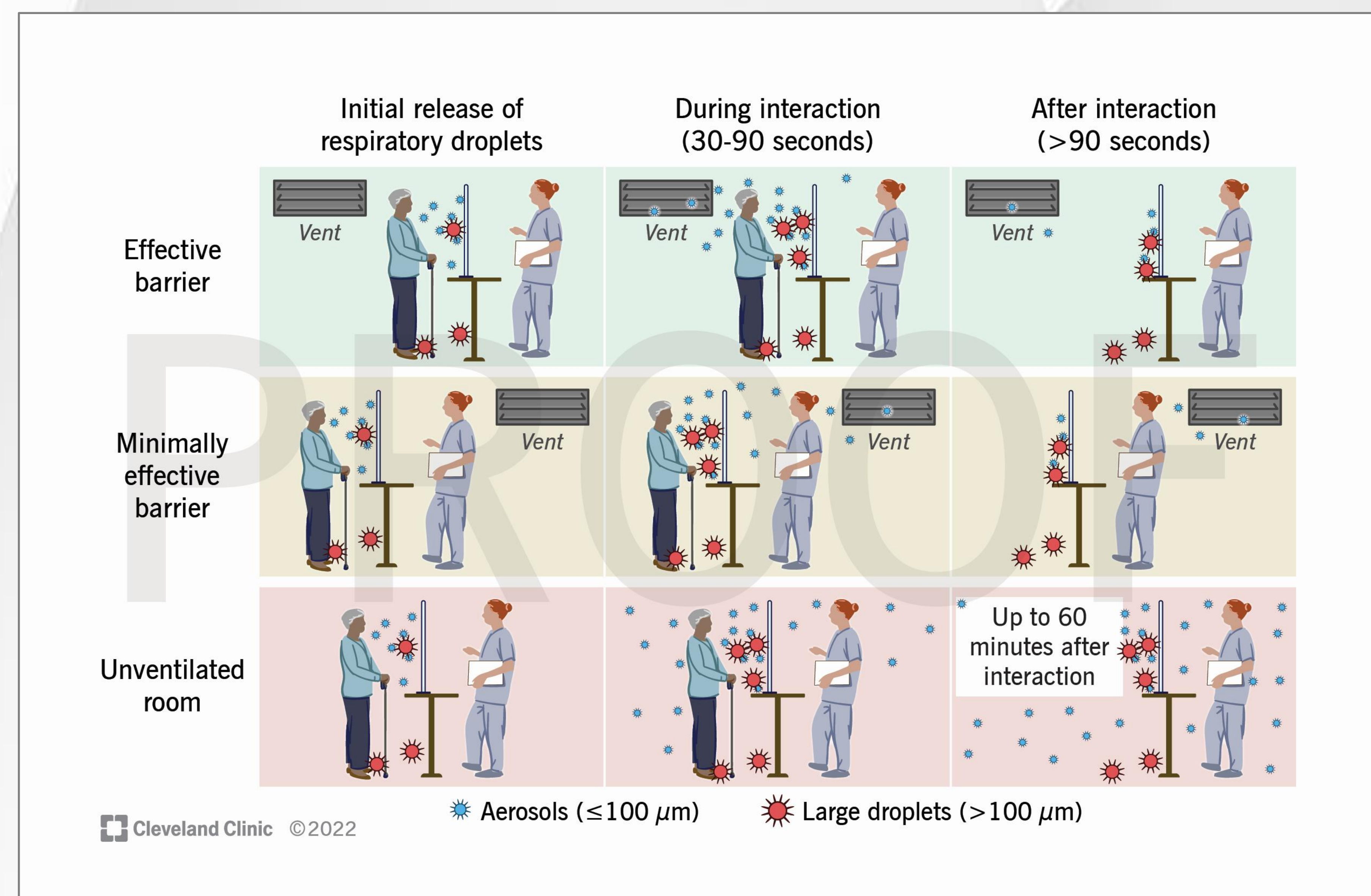
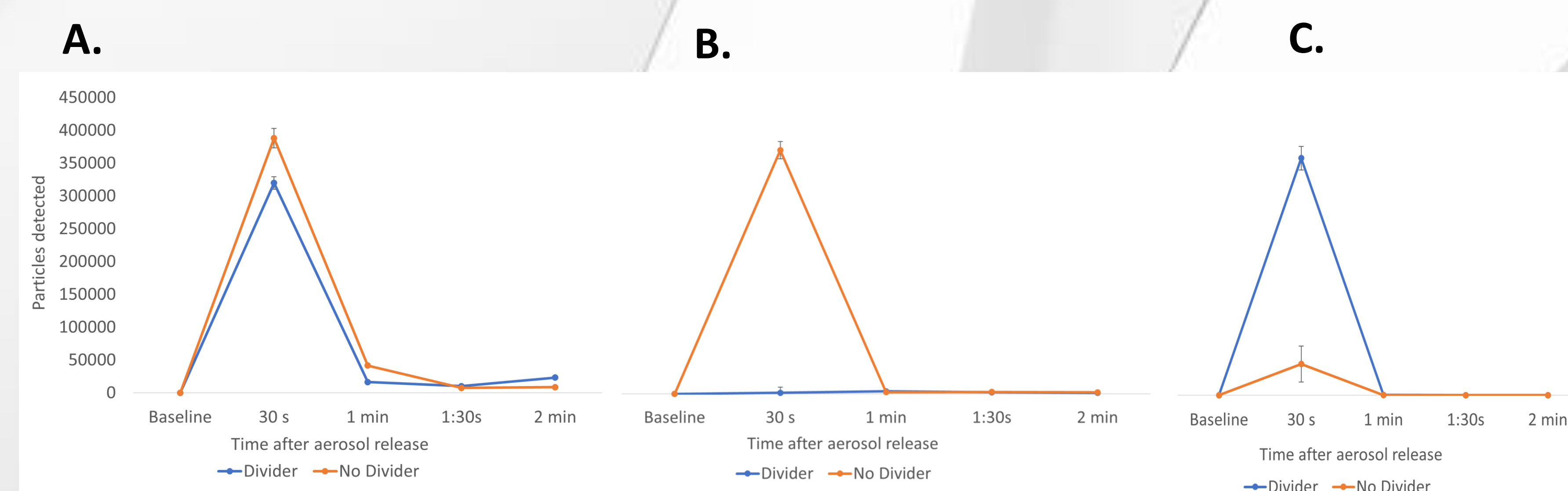


Figure 2. Particle exposure for (A) minimally effective (B) effective and (C) ineffective barriers



Results

- Of 13 dividers tested:
 - 6 (46%) significantly reduced peak aerosol particle counts detected behind the divider
 - 6 (46%) reduced peak particle counts only to modest non-significant degree
 - 1 (8%) significantly increased particle counts behind the divider
- For effective dividers, condensed moisture fog flowed around the divider toward outlet air vents positioned in the ceiling
- Fog pooled immediately behind the divider that increased staff exposure before exiting in an outlet air vent positioned on the side wall.

Conclusions

- In real-world settings, plexiglass barriers vary widely in effectiveness in reducing staff exposure to aerosols, and some barriers may increase risk for exposure.
- Devices that visualize airflow patterns may be useful as simple tools to assess barriers



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