

# 1. Airborne Contaminant Removal

The number of air changes per hour and time and efficiency.

ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency \*

\* This table is revised from Table S3-1 in reference 4 and has been adapted from the formula for the rate of purging airborne contaminants presented in reference 1435.

+ Denotes frequently cited ACH for patient-care areas.

§ Values were derived from the formula:

$$t_2 - t_1 = - [\ln (C_2 / C_1) / (Q / V)] \times 60, \text{ with } t_1 = 0$$

**where**

t1 = initial timepoint in minutes

t2 = final timepoint in minutes

C1 = initial concentration of contaminant

C2 = final concentration of contaminant

$C2 / C1 = 1 - (\text{removal efficiency} / 100)$

Q = air flow rate in cubic feet/hour

V = room volume in cubic feet

$Q / V = \text{ACH}$

† Values apply to an empty room with no aerosol-generating source. With a person present and generating aerosol, this table would not apply. Other equations are available that include a constant generating source. However, certain diseases (e.g., infectious tuberculosis) are not likely to be aerosolized at a constant rate. The times given assume perfect mixing of the air within the space (i.e., mixing factor = 1). However, perfect mixing usually does not occur. Removal times will be longer in rooms or areas with imperfect mixing or air stagnation.<sup>213</sup> Caution should be exercised in using this table in such situations. For booths or other local ventilation enclosures, manufacturers' instructions should be consulted.

**\*The information and table provided here were taken from the CDC website located at this URL:**

<https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html>