



HEALTH CHOICE
ENTERPRISES

Ventilation Analysis

Hospital: Arnold Palmer Hospital

Date: 3/23/2020

Purpose

- To assess ventilation systems and work practice controls effectiveness in minimizing employee exposure to potentially harmful substances and airborne pathogens.
- To utilize testing results as a basis for determining appropriate safety related changes aimed at reducing employee exposure to potentially harmful substances.
- To utilize testing results as a basis for making appropriate recommendations aimed at reducing employee exposure.
- To format documentation in compliance with current guidelines established by the Facilities Guideline Institute.

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VENTILATION ANALYSIS

Facility: Arnold Palmer Hospital

Technician: Jeff Himmelrich

Floor: Misc.

Date: 3/23/2020

| Location | Total Supply CFM | Total Exhaust CFM | Measured Air Exchanges per hour | Required air exchanges per hour | Measured room pressure | Required room pressure | Work Order # | Room size ft3 |
|--------------------------------------|------------------|-------------------|---------------------------------|---------------------------------|------------------------|------------------------|--------------|---------------|
| Emergency Department Decontam | | | | | | | | |
| | | | | | | | | |
| Decontam | Contact | Isolation | | | | | | |
| | | | | | | | | |
| OR's | | | | | | | | |
| | | | | | | | | |
| OR 1 | 1450 | 1210 | 14.8 | 15.0 | NEGATIVE | POSITIVE | | 5884 |
| | | | | | | | | |
| OR 2 | 3674 | 2375 | 34.7 | 15.0 | POSITIVE | POSITIVE | | 6360 |
| | | | | | | | | |
| OR 3 | 1010 | 650 | 15.0 | 15.0 | POSITIVE | POSITIVE | | 4038 |
| | | | | | | | | |
| OR 4 | 1075 | 715 | 15.8 | 15.0 | POSITIVE | POSITIVE | | 4082 |
| | | | | | | | | |
| OR 5 | 1037 | 392 | 15.1 | 15.0 | POSITIVE | POSITIVE | | 4120 |
| | | | | | | | | |
| Substerile 5/6 | 100 | 150 | 5.2 | 10.0 | NEGATIVE | - | | 1732 |
| | | | | | | | | |
| OR 6 | 1232 | 715 | 19.1 | 15.0 | POSITIVE | POSITIVE | | 3864 |
| | | | | | | | | |
| OR 7 | 1770 | 1465 | 25.6 | 15.0 | POSITIVE | POSITIVE | | 4145 |
| | | | | | | | | |
| OR 8 | 2575 | 805 | 21.4 | 15.0 | POSITIVE | POSITIVE | | 7235 |
| | | | | | | | | |
| OR 9 | 2760 | 1320 | 30.9 | 15.0 | POSITIVE | POSITIVE | | 5361 |
| | | | | | | | | |
| Substerile 9/10 | 325 | 475 | 16.7 | 10.0 | NEGATIVE | - | | 1703 |
| | | | | | | | | |
| OR 10 | 2895 | 1110 | 31.8 | 15.0 | POSITIVE | POSITIVE | | 5454 |
| | | | | | | | | |
| OR 11 | 2480 | 1495 | 25.7 | 15.0 | POSITIVE | POSITIVE | | 5787 |
| | | | | | | | | |
| CATH LAB PACU PROC. ROOM 1 | 390 | 160 | 19.4 | 15.0 | POSITIVE | POSITIVE | | 1205 |
| | | | | | | | | |

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| RECOVERY ROOMS | | | | | | | | |
| OR PACU | 2240 | 1907 | 7.2 | 6.0 | - | NR | | 18631 |
| CATH POST OP RECOVERY | 1630 | 1010 | 19.5 | 6.0 | - | NR | | 5010 |
| ENDO RECOVERY | 825 | 325 | 8.4 | 6.0 | - | NR | | 5858 |
| TRAUMA ROOMS | | | | | | | | |
| ER TRAUMA UNIT | 2890 | 1705 | 18.5 | 15.0 | POSITIVE | POSITIVE | | 9397 |
| AIRBORNE INFECTION ISOLATION | | | | | | | | |
| ER - EXAM 1 | 99 | 209 | 13.2 | 6.0 | NEGATIVE | NEGATIVE | | 950 |
| ER - EXAM 14 | 66 | 123 | 4.8 | 6.0 | NEGATIVE | NEGATIVE | | 1549 |
| ER - EXAM 15 | 39 | 220 | 10.6 | 6.0 | NEGATIVE | NEGATIVE | | 1247 |
| 2001 | 853 | 1255 | 20.7 | 6.0 | POSITIVE | NEGATIVE | | 3645 |
| 2002 | 940 | 1280 | 23.1 | 6.0 | NEGATIVE | NEGATIVE | | 3327 |
| 2023 | 539 | 821 | 21.3 | 6.0 | NEGATIVE | NEGATIVE | | 2313 |
| 2024 | 308 | 538 | 12.2 | 6.0 | NEGATIVE | NEGATIVE | | 2645 |
| 2025 | 340 | 610 | 15.3 | 6.0 | NEGATIVE | NEGATIVE | | 2399 |
| 2026 | 305 | 570 | 14.4 | 6.0 | NEGATIVE | NEGATIVE | | 2380 |
| PACU ISO 15 | 270 | 380 | 18.4 | 6.0 | NEGATIVE | NEGATIVE | | 1237 |
| PACU ISO 16 | 255 | 415 | 25.2 | 6.0 | NEGATIVE | NEGATIVE | | 990 |
| PACU ISO 17 | 255 | 375 | 23.8 | 6.0 | NEGATIVE | NEGATIVE | | 945 |
| PRE OP 16 | 280 | 370 | 21.0 | 6.0 | NEGATIVE | NEGATIVE | | 1058 |
| PRE OP 17 | 286 | 366 | 21.4 | 6.0 | NEGATIVE | NEGATIVE | | 1027 |
| 3039 | 225 | 330 | 11.8 | 6.0 | NEGATIVE | NEGATIVE | | 1685 |

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| 3052 | 85 | 260 | 16.6 | 6.0 | NEGATIVE | NEGATIVE | | 939 |
| 4010 | 220 | 445 | 12.1 | 6.0 | NEGATIVE | NEGATIVE | | 2205 |
| 5010/5011 | 215 | 316 | 8.6 | 6.0 | NEGATIVE | NEGATIVE | | 2205 |
| 6008/6009 | 205 | 230 | 6.3 | 6.0 | NEGATIVE | NEGATIVE | | 2205 |
| 7005 | 85 | 460 | 22.9 | 6.0 | NEGATIVE | NEGATIVE | | 1206 |
| DIALYSIS EXAM 3 | 65 | 330 | 18.4 | 6.0 | NEGATIVE | NEGATIVE | | 1077 |
| Ante Rooms | | | | | | | | |
| Ante- 2001/02 | 320 | N/A | 30.7 | 10.0 | NEGATIVE TO HALL | - | | 625 |
| Ante- 2023/24 | 110 | N/A | 14.2 | 10.0 | NEGATIVE TO HALL | - | | 464 |
| Ante 2025 | 198 | N/A | 22.5 | 10.0 | Negative to Hall | - | | 527 |
| Ante 2026 | 75 | N/A | 9.3 | 10.0 | Negative to Hall | - | | 484 |
| Ante 3039 | N/A | 95 | 18.4 | 10.0 | Negative to Hall | - | | 310 |
| Ante 3052 | N/A | 45 | 11.7 | 10.0 | Negative to hall | - | | 230 |
| Ante 4010 | N/A | 72 | 10.1 | 10 | Negative to hall | - | | 428 |
| Ante 5010/11 | 60 | N/A | 12.4 | 10.0 | Negative to hall | - | | 290 |
| Ante 6008/09 | 40 | N/A | 8.9 | 10.0 | Negative to hall | - | | 270 |
| Ante 7005 | N/A | 130 | 28.9 | 10.0 | Negative to hall | - | | 270 |

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| X-RAY (SURGERY/CRITICAL CARE AND CATHETERIZATION) | | | | | | | | |
| HYBRID CATH | 3590 | 1635 | 20.1 | 20.0 | POSITIVE | POSITIVE | | 10712 |
| AUTOPSY ROOM | | | | | | | | |
| MORGUE | 602 | 1028 | 12.3 | 12.0 | NEGATIVE | NEGATIVE | | 5004 |
| SCOPE CLEANING | | | | | | | | |
| Scope Clean Hybric Cath | 55 | 150 | 14.8 | 10.0 | POSITIVE | NEGATIVE | | 609 |
| ENDO SCOPE ROOM | 115 | 340 | 27.1 | 6.0 | NEGATIVE | NEGATIVE | | 752 |
| ENDOSCOPY (PROCEDURE ROOM) | | | | | | | | |
| ENDOSCOPY 1 | 240 | 65 | 12.7 | 6.0 | - | NR | | 1132 |
| ENDOSCOPY 2 | 305 | 45 | 15.1 | 6.0 | - | NR | | 1215 |
| ENDOSCOPY 3 | 295 | 25 | 10.5 | 6.0 | - | NR | | 1681 |
| NUCLEAR MEDICINE HOT LAB | | | | | | | | |
| HOT LAB | 55 | 195 | 20.8 | 6.0 | NEGATIVE | NEGATIVE | | 563 |
| NUCLEAR MEDICINE TREATMENT ROOM | | | | | | | | |
| NUCLEAR MEDICINE | 488 | 660 | 7.2 | 6.0 | NEGATIVE | NEGATIVE | | 5492 |

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| CLEAN WORKROOMS | | | | | | | | |
| SPD CLEAN RM | 2126 | 1080 | 10.5 | 4.0 | POSITIVE | POSITIVE | | 12108 |
| DECONTAMINATION ROOM | | | | | | | | |
| SPD DECONTAM | 865 | 1120 | 12.3 | 6.0 | NEGATIVE | NEGATIVE | | 4126 |
| CLEAN ROOMS | | | | | | | | |
| Acute Clean 1E100 | 120 | 0 | 10.3 | 4.0 | POSITIVE | POSITIVE | | 696 |
| Acute Clean 2 | 165 | 119 | 8.9 | 4.0 | POSITIVE | POSITIVE | | 1111 |
| PICU Clean 2E041 | 104 | N/A | 8.9 | 4.0 | POSITIVE | POSITIVE | | 701 |
| PICU Clean 2038 | 98 | 0 | 6.4 | 4.0 | POSITIVE | POSITIVE | | 917 |
| Clean 3A27 | 75 | 35 | 2.6 | 4.0 | POSITIVE | POSITIVE | | 1754 |
| GITC Clean 3C134 | 420 | N/A | 24.0 | 4.0 | POSITIVE | POSITIVE | | 1049 |
| Pre-op Clean 3E049 | 143 | N/A | 10.8 | 4.0 | POSITIVE | POSITIVE | | 798 |
| Pre-op Clean 3E049 | 143 | N/A | 10.8 | 4.0 | POSITIVE | POSITIVE | | 798 |
| 4th Floor Clean | 110 | 88 | 10.8 | 4.0 | POSITIVE | POSITIVE | | 613 |
| Clean 5E039 | 55 | N/A | 4.2 | 4.0 | POSITIVE | POSITIVE | | 793 |
| Clean 6E008 | 90 | N/A | 7.4 | 4.0 | NEGATIVE | POSITIVE | | 733 |
| Clean 129 Feeding | 80 | 0 | 9.6 | 4.0 | POSITIVE | POSITIVE | | 498 |
| Clean END117 | 45 | 40 | 6.7 | 4.0 | POSITIVE | POSITIVE | | 401 |
| Kids Kidney Clean | 200 | N/A | 12.7 | 4.0 | POSITIVE | POSITIVE | | 946 |
| Cellular Therapy Lab | 665 | HOODS | 13.0 | 4.0 | POSITIVE | POSITIVE | | 3071 |

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| Soiled Rooms | | | | | | | | |
| Acute Soiled 1E98 | 70 | 75 | 5.3 | 10.0 | NEGATIVE | NEGATIVE | | 857 |
| Acute 2 Soiled | 100 | 125 | 6.5 | 10.0 | NEGATIVE | NEGATIVE | | 1156 |
| PSCU Soiled 2E038 | 65 | 135 | 6.8 | 10.0 | NEGATIVE | NEGATIVE | | 1198 |
| PICU Soiled E079 | N/A | 175 | 16.6 | 10.0 | NEGATIVE | NEGATIVE | | 633 |
| PICU Soiled 2039 | 81 | 194 | 11.3 | 10.0 | NEGATIVE | NEGATIVE | | 1030 |
| PICU Soiled | 0 | 176 | 15.0 | 10.0 | NEGATIVE | NEGATIVE | | 703 |
| Soiled 3A37 | 65 | 154 | 11.2 | 10.0 | NEGATIVE | NEGATIVE | | 824 |
| GITC Soiled 3C135 | 0 | 75 | 6.3 | 10.0 | NEGATIVE | NEGATIVE | | 710 |
| Pre-Op Soiled 3E048 | 165 | 270 | 18.2 | 10.0 | NEGATIVE | NEGATIVE | | 889 |
| OR Soiled 3B11 | 125 | 225 | 10.0 | 10.0 | NEGATIVE | NEGATIVE | | 1344 |
| Soiled 4A16 | 0 | 132 | 10.0 | 10.0 | NEGATIVE | NEGATIVE | | 789 |
| Soiled 4th floor | 47 | 182 | 13.9 | 10.0 | NEGATIVE | NEGATIVE | | 784 |
| Soiled 6E018 | 50 | 198 | 15.2 | 10.0 | NEGATIVE | NEGATIVE | | 784 |
| 7th Fl Soiled | 75 | 145 | 19.2 | 10.0 | NEGATIVE | NEGATIVE | | 452 |
| 7th Fl Soiled Across from 7011 | 50 | 240 | 21.7 | 10.0 | NEGATIVE | NEGATIVE | | 664 |
| 8B806 Soiled | 0 | 235 | 13.1 | 10.0 | NEGATIVE | NEGATIVE | | 1078 |
| END-127 Soiled | N/A | 85 | 50.0 | 10.0 | NEGATIVE | NEGATIVE | | 102 |

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| HIGH LEVEL DISINFECTANT/CHEMICAL STORAGE ROOMS | | | | | | | | |
| | | | | | | | | |
| PATHOLOGY GROSSING ROOM | 110 | 223 | 7.2 | 6.0 | NEGATIVE | NEGATIVE | | 1854 |
| | | | | | | | | |
| SPECIMEN HOLDING | 25 | 100 | 7.1 | 6.0 | NEGATIVE | NEGATIVE | | 842 |
| | | | | | | | | |
| FORMALDEHYDE STORAGE | 83 | 220 | 14.0 | 6.0 | NEGATIVE | NEGATIVE | | 943 |
| | | | | | | | | |
| Morgue Soiled Unit | 92 | 258 | 50.8 | 6.0 | NEGATIVE | NEGATIVE | | 305 |
| | | | | | | | | |
| Morgue Work Room | 110 | 190 | 9.7 | 6.0 | NEGATIVE | NEGATIVE | | 1177 |

SUMMARY / RECOMMENDATIONS

All areas were checked for proper air movement relationships concerning positive and negative airflows to adjacent areas, along with the minimum total air exchange rates per hour. These guidelines are established by the Facility Guidelines Institute for the U.S. Department of Health and Human Services.

An Alnor Flowhood was used to determine the total air supply and exhaust along with the air exchange rates for each area. A TSI micromanometer was used to check the positive and negative airflows.

Please refer to the Guidelines for Design and Construction of Hospitals and Health Care Facilities (Facility Guidelines Institute) for the proper ventilation requirements affecting patient care areas.

The following rooms had incorrect or insufficient room pressure relationships:

OR 1, 2001, Scope clean hybrid cath, Clean 6E008

The following rooms measured below the recommended air exchange rates:

OR 1, Sub Sterile 5/6, ER Exam 14, Ante 2026, Clean 3A27, Acute Soiled 1E98, Acute 2 Soiled, PSCU Soiled 2E038, GITC Soiled 3C135.

The following rooms were unavailable for testing:

N/A

The following rooms were under constructio:

N/A

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The following rooms had incorrect or insufficient room pressure relationships: (This would need better formatting)

OR 1 1450 1210 **14.8** 15.0 **NEGATIVE** POSITIVE 5884
2001 853 1255 20.7 6.0 POSITIVE **NEGATIVE** 3645
Scope Clean Hybrid Cath 55 150 14.8 10.0 POSITIVE **NEGATIVE** 609
Clean 6E008 90 N/A 7.4 4.0 **NEGATIVE** POSITIVE 733

The following rooms measured below the recommended air exchange rates:

OR 1 1450 1210 **14.8** 15.0 **NEGATIVE** POSITIVE 5884
Sub sterile 5/6 100 150 **5.2** 10.0 **NEGATIVE** - 1732
ER - EXAM 14 66 123 **4.8** 6.0 **NEGATIVE** **NEGATIVE** 1549
Ante 2026 75 N/A **9.3** 10.0 Negative to Hall - 484
Clean 3A27 75 35 **2.6** 4.0 POSITIVE **POSITIVE** 1754
Acute Soiled 1E98 70 75 **5.3** 10.0 **NEGATIVE** **NEGATIVE** 857
Acute 2 Soiled 100 125 **6.5** 10.0 **NEGATIVE** **NEGATIVE** 1156
PSCU Soiled 2E038 65 135 **6.8** 10.0 **NEGATIVE** **NEGATIVE** 1198
GITC Soiled 3C135 0 75 **6.3** 10.0 **NEGATIVE** **NEGATIVE** 710

The following rooms were unavailable for testing:

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