

| Table 1   | AARConnect  | CHA       | Total    | <i>P</i> |
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| How do you define HFNC  | n=35  | n=27      |          |          |
| Any heated/humidified and blended gas delivered via nasal cannula                                   | 18 (50%)  | 13 (48%)  | 31 (49%) | 0.10     |
| Heated gas delivered via nasal cannula at flow greater or equal to the patient's inspiratory demand | 11 (31%)  | 2 (7%)    | 13 (21%) |          |
| Comments  | <ul style="list-style-type: none"> <li>• Age and WOB</li> <li>• We don't</li> <li>• 6 ml/kg times respiratory rate</li> <li>• Age, size, WOB</li> <li>• Best guesstimate to match the child's breathing, usually start at 5 lpm</li> <li>• During assessment of clinical response to therapy along with protocol guidelines</li> <li>• Estimated, age and subjective WOB taken into account</li> <li>• For pediatrics, 2 L/kg predicted body weight as a starting point</li> <li>• Pt evaluation of WOB in children's Ped/PICU</li> <li>• RT assessment – all things listed in next question</li> </ul> |           |          |          |
| Nasal cannula flow above pre-defined thresholds based on the patient's age or weight                | 3 (8%)  | 7 (26%)   | 10 (16%) |          |
| Comments  | <ul style="list-style-type: none"> <li>• For Peds greater than 2 lpm</li> <li>• 4 lpm for &lt; 2 yr old</li> <li>• &gt;0.5 l for neo Peds is a mix – if inhaled meds needed and oxygen requirement for approx 5 years and less Adults: if FiO2 requirement &gt; 40%</li> </ul>  |           |          |          |
| Other/no response   | 4 (11%)   | 2 (7%)    | 6 (10%)  |          |
| Comments  | 1. Nicu= 2 lpm PICU= 20 lpm Adult = 50 lpm  |           |          |          |
| Parameters monitored during RT assessments  | n=35  | n=27      |          |          |
| Respiratory rate  | 35 (100%)   | 27 (100%) | 62(100%) | 0.38     |
| Heart rate  | 26 (74%)  | 25 (93%)  | 48 (77%) | 0.04     |
| Heart rate via continuous ECG   | 23 (66%)  | 18 (67%)  | 41 (66%) | 0.82     |
| Work of breathing   | 28 (80%)  | 25 (93%)  | 53 (85%) | 0.11     |
| Blood pressure  | 7 (20%)   | 5 (19%)   | 12 (19%) | 0.93     |
| Pulse oximetry (SpO2)   | 34 (97%)  | 26 (96%)  | 60 (97%) | 0.73     |

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| Transcutaneous CO2   | 5 (14%)   | 5 (19%)  | 10 (16%) | 0.62 |
| Near infrared spectroscopy   | 0 (0%)  | 3 (11%)  | 3 (5%)   | 0.04 |
| How frequently are patients assessed by an RT in the ED                                | n=28  | n=26     |          |      |
| Every 2 hours  | 12 (43%)  | 10 (38%) | 22 (41%) | 0.24 |
| Every 4 hours  | 10 (36%)  | 9 (35%)  | 19 (35%) |      |
| Every 6 hours  | 0 (0%)  | 1 (4%)   | 1 (2%)   |      |
| Other  | 6 (24%)   | 6 (23)   | 12 (22%) |      |
| How frequently are patients assessed by an RT in the on step-down or intermediate care | n=26 responses  | n=19     |          |      |
| Every 2 hours  | 2 (8%)  | 1 (5%)   | 3 (7%)   | 0.42 |
| Every 4 hours  | 22 (85%)  | 14 (74%) | 36 (80%) |      |
| Every 6 hours  | 1 (4%)  | 4 (21%)  | 5 (11%)  |      |
| Other  | 1 (4%)  | 0 (0%)   | 1 (2%)   |      |
| How frequently are patients assessed by an RT in the on general floors                 | n=20  | n=19     |          |      |
| Every 2 hours  | 4 (20%)   | 1 (5%)   | 5 (13%)  | 0.29 |
| Every 4 hours  | 13 (65%)  | 13 (68%) | 26 (67%) |      |
| Every 6 hours  | 3 (15%)   | 5 (26%)  | 8 (21%)  |      |
| Other  | 0 (0%)  | 0 (0%)   | 0 (0%)   |      |
| How frequently are patients assessed by an RT in the ICU                               | n=32  | n=27     |          |      |
| Every 2 hours  | 8 (25%)   | 4 (15%)  | 12 (20%) |      |
| Every 4 hours  | 22 (69%)  | 17 (63%) | 39 (66%) |      |
| Every 6 hours  | 0 (0%)  | 6 (22%)  | 6 (10%)  |      |
| Other  | 2 (6%)  | 0 (0%)   | 2 (8%)   |      |
| Diseases in which HFNC is used   | n=35  | n=27     |          |      |
| Bronchiolitis  | 33 (94%)  | 26 (96%) | 59 (95%) | 0.46 |
| Asthma   | 24 (69%)  | 17 (63%) | 41 (66%) | 0.76 |
| Pneumonia  | 27 (77%)  | 20 (74%) | 47 (76%) | 0.93 |
| Post-operative   | 18 (51%)  | 15 (56%) | 33 (53%) | 0.66 |
| ARDS   | 14 (40%)  | 16 (59%) | 30 (48%) | 0.11 |
| Comments   | <ul style="list-style-type: none"> <li>• post extubation, any needs for incr FiO2</li> <li>• Post extubation depending on FiO2 requirement</li> <li>• Neonates/RSV-Bronchiolitis</li> <li>• Does not tolerate aerosol mask or other forms of O2 delivery</li> <li>• COPD, did not tolerate NIV, ETOH</li> <li>• By MD order</li> <li>• Any hypoxemic state</li> </ul> |          |          |      |
| What method is used to set flow  | n=35  | n=26     |          |      |

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| rate  |   |          |          |      |
| Age based (different flow for different ages)   | 6 (17%)   | 3 (12%)  | 9 (15%)  | 0.91 |
| Other   | 1 (3%)  | 2 (8%)   | 3 (5%)   |      |
| Per provider orders   | 12 (34%)  | 9 (35%)  | 21 (34%) |      |
| Per RT driven protocol  | 8 (23%)   | 9 (35%)  | 17 (28%) |      |
| Weight based (e.g. 1 L/kg/min)  | 6 (17%)   | 3 (12%)  | 9 (15%)  |      |
| Comments  | • Age and WOB   |          |          |      |
| How is flow rate adjusted   | n=35  | n=26     |          |      |
| Based upon vital signs (RR, HR, WOB)  | 16 (46%)  | 5 (19%)  | 21 (34%) | 0.22 |
| Other   | 2 (6%)  | 1 (4%)   | 3 (5%)   |      |
| Per provider orders   | 8 (23%)   | 7 (27%)  | 15 (25%) |      |
| Per RT driven protocol  | 9 (26%)   | 13 (50%) | 22 (36%) |      |
| Comments  | • Combination of vital signs and physician order  |          |          |      |
| In general, when a patient's oxygenation on HFNC is below goal, what do you do first? | n=35  | n=25     |          |      |
| Increase FiO2   | 23 (66%)  | 11 (44%) |          | 0.28 |
| Increase flow rate  | 9 (26%)   | 9 (36%)  |          |      |
| Other   | 3 (9%)  | 5 (20%)  |          |      |
| In general, what is the next step if a patient fails HFNC?                            | n=35  | n=24     |          |      |
| CPAP  | 9 (26%)   | 6 (25%)  | 15 (25%) | 0.67 |
| Intubation  | 3 (9%)  | 1 (4%)   | 4 (17%)  |      |
| Noninvasive ventilation   | 21 (60%)  | 16 (67%) | 37 (63%) |      |
| Other   | 2 (6%)  | 1 (4%)   | 3 (5%)   |      |
| Comment   | • Increase FiO2 up to 60%, then start increasing flow if that does not resolve low oxygenation. |          |          |      |

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| Table 3   |          |          |          |      |
| Do you deliver aerosol therapy to patients receiving HFNC?  | n=35     | n=27     | n=62     |      |
| Yes   | 27 (77%) | 21 (78%) | 48 (76%) | 0.68 |
| When delivering aerosolized medications to patients receiving HFNC do you (select all that apply) |          |          |          |      |
| Deliver aerosol with vibrating mesh nebulizer   | 24 (89%) | 13 (48%) | 37 (77%) | 0.14 |
| Jet nebulizer   | 2 (7%)   | 1 (5%)   | 3 (6%)   | 0.73 |
| Reduce HFNC flow  | 3 (11%)  | 3 (14%)  | 6 (13%)  | 0.71 |
| Take patient off HFNC   | 3 (11%)  | 8 (38%)  | 11       | 0.03 |

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| and deliver treatment with MDI or jet nebulizer      |   |          | (23%)    |      |
| What medications do you deliver via HFNC?            | n=27  | n=21     | n=48     |      |
| Beta2 agonists                                       | 26 (96%)  | 18 (86%) | 44 (92%) | 0.63 |
| Mucolytics   | 11 (41%)  | 10 (48%) | 21 (44%) | 0.59 |
| Corticosteroids                                      | 15 (56%)  | 9 (43%)  | 24 (50%) | 0.50 |
| Other  | 1 (4%)  | 1 (5%)   | 2 (4%)   | 0.84 |
| Comments   | <ul style="list-style-type: none"> <li>inhaled Epo and all Resp drugs</li> </ul>  |          |          |      |
| Where do you place the nebulizer in the HFNC system? | n=27  | n=21     | n=48     |      |
| Dry side of humidifier                               | 20 (74%)  | 9 (43%)  | 29 (60%) | 0.08 |
| Wet side of humidifier                               | 1 (4%)  | 2 (10%)  | 3 (6%)   | 0.39 |
| Between cannula and circuit                          | 3 (11%)   | 5 (24%)  | 8 (17%)  | 0.23 |
| Other  | 1 (4%)  | 1 (5%)   | 2 (4%)   | 0.84 |
| General comments                                     | <ul style="list-style-type: none"> <li>On occasion we use a heated/humidified nasal cannula but if may not necessarily be 'HFNC'. It is more out of concern for mucosal and or cooling/ drying of the upper airway. We are still working on a HFNC algorithm to use HFNC on our Pediatric floors.</li> <li>25 bed critical access hospital</li> <li>If Sat is low we up flow and FiO2</li> <li>Our facility does not use HFNC correctly. We cannot get our APPs to understand that HF means you meet or exceed the patients demand!!!</li> <li>Questionable efficacy of AeroNeb aerosol penetration/deposition during HFNC therapy</li> <li>We actually use HHFNC (heated, humidified gas at high flows) and HFNC (flows greater than expected for age group, unheated). I answered questions regarding the heated setup because the HFNC practice varies greatly between age groups and it seemed more pertinent to your survey. We deliver aerosol via cannula for pediatric patient but not for adults (because of the higher flow rates)</li> <li>We are in the process of upgrading our HFNC usage and will be expanding to the pediatric</li> </ul> |          |          |      |

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|  | <p>population. We began this expansion with a request of from the pediatrician for heated humidity with room air, we do not have piped air in the pediatric unit and explored this as the alternative.</p> <ul style="list-style-type: none"><li>• We follow Seattle Children's hospital algorithms for HFNC and do not keep any peds who require HFNC long term (more than 2 -3hours) due to our rural location.</li></ul> |
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