F&P Optiflow

Flow Matters

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COVID-19 版

COVID-19 的爆發及持續激增已經影響到世界各地的醫療機構。使用Optiflow ™ 經鼻高流量氧氣濕化治療（NHF）療法治療病患，而其與傳播風險的關聯仍然受到挑戰。

「及時需要 [NHF] 的病人... 由於他們有產生氣溶膠的傾向，他們可能具有很高的疾病傳播風險，但我們找不到暫緩或延遲他們接受 [這種療法] 的依據。相反，我們的結論是，呼吸道活動本身是氣溶膠產生的主要模式，並且比目前廣泛認可的傳播風險更大。」**- Wilson et al. Anaesthesia.2021.**[1]

摘要

以下已成為 COVID-19 臨床管理的雙重主要目標：

- 改善病患的治療成效，例如避免氣管插管。
- 保障醫護人員（HCW）的安全，例如避免院內感染的增加。

總結，COVID-19 實證指引[2-9]**、已發表的 NHF 使用經驗**[10-22]**、醫護人員感染的臨床觀察結果**[10-11,18,21-23]**、呼出顆粒擴散的試驗性研究**[1,24-42]**以及專家建議**[43-50]**指出：**

- 對於由病毒性肺炎引起的低氧血症病患（如 COVID-19），建議採用 NHF 給予呼吸輔助。[10-22]
- 目前不認為 NHF 會經由接觸、飛沫噴濺或空氣傳播路徑，增加 HCW 感染的風險。[10-11,18,21-23]
  - » 在醫院準備建議中倡導使用 NHF。[24,43-45]
  - » 應依據新出現的證據下討論產生氣溶膠程序 (AGP) 的範例。[1,41-49]
  - » 咳嗽現在被認為是相對較高風險的呼吸運動，因此可以考慮所有形式的呼吸治療。[1,25,37,40-42,46-47,50]

改善病患療效

使用 NHF 來改善 COVID-19 病患的治療效果已經在發表的文獻中有據可查：

實證指引

已發表建議為 COVID-19 病患使用 NHF 的實證指引之組織數量持續增加：

- 世界衛生組織[2]
- 美國國家衛生研究院[3]
- 中華人民共和國國家衛生委員會[4]
- 敗血症存活運動[5]
- 澳大利亞和紐西蘭重症監護協會[6]
- 歐洲呼吸學會[7]
- 國際專家共識聲明[8]
- 由法國各種重症監護團體之成員所組成的小組之專家建議[9]

有關 COVID-19 病患結果的觀察研究

由於 NHF 已被用作整個大流行中的呼吸輔助，因此其對病患結果影響之臨床觀察已經過同儕審查、發表並持續在出現。[10-22]

已觀察到對 COVID-19 病患使用 NHF 時：

- 避免[10-13,19]和幫助病患預防使用機械通氣[13-16]
- 降低死亡率。[10,14]
- 在 ICU 環境外成功使用。[16-18]
- 縮短住院時間。[19-20]

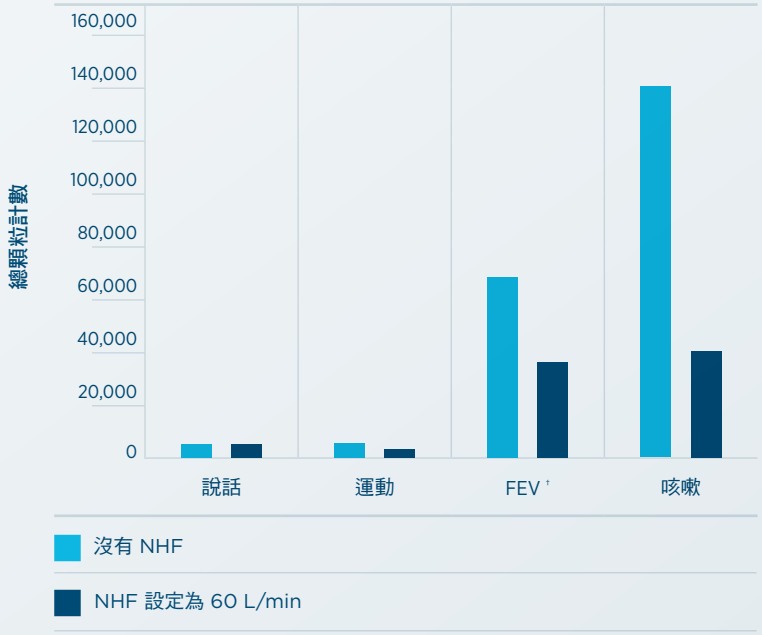
使用「[NHF] 與 COVID-19 感染病患使用侵入性呼吸器和整體死亡率降低有關。」 **- Patel et al. 2020.**[10]

維護醫護人員的安全

總體來說，臨床觀察，[10-11,18,21-23] 調查性研究[1,24-42] 和專家意見[43-50] 顯示，NHF 不認為會使HCWs 感染的風險增加。

Wilson et al. 2021 [1] 比較呼吸活動、非侵入性呼吸輔助和面罩對氣溶膠產生的影響。該發表的研究是第一個成功地從整個呼吸氣體中得到數據的文獻。研究結果如下圖所示。

呼吸活動的總顆粒數比較 *



* 從Wilson et al. 2021 整理的數據[1]

† FEV：強制用力吐氣量。用為代替有症狀的呼吸困難和肺部塌陷的數字。

專家意見

NHF 的倡導

Wilson et al. 的發表文獻[1] 增加了專家的研究機構[24,43-45] 倡導為 COVID-19 病患使用 NHF ：

「 ...管理者及政策制定者必須考慮修改方案，不僅要允許，而且實際上應該鼓勵使用 [NHF] 治療嚴重低氧血症 COVID-19 病患，尤其在沒有此項選擇的情況下，病患會使用[機械換氣]，」。**- Gershengorn et al. 2020.[24]**

AGP 範例

文獻[1,42]和論文[41,46-49]質疑術語 AGP 的準確性和有用性，特別強調將 NHF 等呼吸輔助療法歸類為 AGP：

「最近的數據提出了疑問，是否目前被列為 AGP 的程序，包括氣管插管和拔管、非侵襲式通氣和高流量鼻氧，真的會產生氣溶膠。」 **– Cook et al. 2021.[47]**

「我們建議停止使用氣溶膠產生程序 (AGP) 此詞，因為它是 [不] 準確（許多這些程序不會在大於咳嗽的動作時產生氣溶膠），意味著氣溶膠排放只是從特定的程序（而不是在正常呼吸事件期間產生），可能會錯誤識別感染風險的來源，並將二進制定義應用於一個更複雜的情況。」**– Hamilton et al. 2021.[41]**

對 HCWs 的病患有關風險

研究人員和專家已考慮過 COVID-19 病患呼吸活動（如咳嗽）產生的氣溶膠，以及其對醫護人員的風險：[1,25,37,40-42,46-47,50]

「我們已經證明，在常見的用力呼吸活動期間，每分鐘的排放量通常比 [NHF] 和 [NIV]（目前被列為氣溶膠產生程序）期間大一到兩個數量級。重要的是，當這些療法用於模仿呼吸道疾病的用力呼吸 活動時，排放量與單獨活動相比時會減少。」**- Wilson et al. 2021.[1]**

「呼吸道排發出的氣溶膠似乎並沒有因 [NHF] 增加。雖然直接的比較是有複雜性，但咳嗽似乎是會產生大量的氣溶膠，其大小範圍與 SARS-CoV-2 空氣傳播可相容。因此，在 COVID-19 病患咳嗽的所有地區內，SARS-CoV-2 的氣溶膠化風險都很可能是高的。個人防護裝備政策的指引應反映這些最新的風險。」**– Hamilton et al. 2021.[42]**

有用的詞彙

顆粒：
具有實體尺寸的物質，例如水蒸氣分子、病原體（病毒或細菌）、氣溶膠或飛沫。

水蒸氣分子：
H_2O 的氣態顆粒。
尺寸：<0.001 微米。

病毒：
僅在活細胞中複製的傳染媒介物。
尺寸：0.017 – 0.3 微米。

細菌：
傳染性生物。
尺寸：0.2 – 10 微米。

氣溶膠：
很小的液體顆粒，通常懸浮在空氣中。
尺寸：最大約 5 微米。

飛沫：
較大的液體顆粒，通常落在地面上。
尺寸：約 5 微米。

醫用顆粒：
包含懸浮藥劑（如 salbutomol ）的氣溶膠或飛沫，用於輸送給病患。

醫用氣溶膠：
足夠小的醫用顆粒，可以輸送到病患的下氣道或肺部。

生物顆粒：
病患在呼氣過程中排出的氣溶膠或飛沫，其中包括生物材料（例如懸浮的病原體）。

生物氣溶膠：
非常小的生物顆粒，通常懸浮在空氣中。
尺寸：最大約 5 微米。

生物飛沫：
較大的生物顆粒，通常會落在地面上。
尺寸：約 5 微米。

生物氣溶膠產生過程：
此過程包含已知的病患呼吸道將液體分解成氣溶膠大小顆粒的互動作用。

生物氣溶膠的擴散過程：
一種不能將液體分解為氣溶膠，但可以讓在正常呼吸道功能下產生的生物氣溶膠擴散的過程。

如欲得到更多資訊，請瀏覽 F&P 網頁：
www.fphcare.com/COVID-19 或點擊以下超連結。

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