

Development and Validation of a Multidisciplinary Standardized Management Pathway for Hypoxemic Respiratory Failure and ARDS

Supplementary Digital Content

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Supplementary Digital Content 1. Summary of HRF and ARDS statements and qualifying criteria included by the expert panel in a modified Delphi consensus process.

Statements and <i>qualifying criteria</i> ** for items for screening in HRF/ARDS					Median (% agree) ⁺
(1) All mechanically ventilated patients should have their height and PBW measured / calculated upon intubation and / or admission to ICU.					9 (97)
<i>i. When should documentation occur?</i>	<i>Prior to charting</i>	<i>Within 1H</i>	<i>Within 4H</i>		
	32%	64%	5%		
Statements and qualifying criteria for screening for HRF/ARDS					
(2) Screening is completed on all patients who are mechanically ventilated for ≥ 24 hours.					9 (74)
(3) Screening is completed only if patient has a certain PF ratio.					8.5 (76)
<i>ii. What PF ratio?</i>	<i>PF<100</i>	<i>PF<200</i>	<i>PF<300</i>		
	0%	4%	96%		
(4) An arterial blood gas (ABG) should be completed daily at clinical steady state between 00:00 and 08:00					8.5 (79)
(5) A chest x-ray should be completed as part of the screening process for diagnosis of HRF/ARDS and/or determine the presence of bilateral infiltrates (as per the Berlin definition).					9 (86)
(6) A chest x-ray for screening should be completed only if patient has a certain PF ratio.					8.5 (75)
<i>iii. What PF ratio?</i>	<i>PF<100</i>	<i>PF<200</i>	<i>PF<300</i>		
	0%	14%	86%		
(7) Patients should be identified and classified using the Berlin criteria for ARDS.					9 (96)
(8) Patients who are eligible for screening should be determined by an RRT.					9 (86)
(9) The screening process would be completed by the RRT.					9 (97)
(10) Results of the screen (positive or negative) to be reported on daily rounds by the RRT					9 (97)
(11) Patients that are screened negative for HRF/ARDS would be rescreened Q24H (if eligible)					9 (86)
(12) The need for screening is determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.					8.5 (71)
(13) Intensivist/delegate to interpret the chest x-ray completed for screening to determine the presence of ARDS.					9 (96)
(14) The Intensivist/delegate (on daily rounds) would appropriately r/o heart failure as the primary cause of ARDS					9 (100)
Statements for goals and early management of HRF/ARDS					
The goal of lung protective strategies / ventilation include:					
(15) Aiming for a neutral or negative fluid balance in the absence of contraindications (unstable hemodynamics, rising creatinine, hypovolemia).					8 (89)
(16) The use of controlled mode of ventilation for all patients with HRF/ARDS.					9 (69)
(17) If on controlled ventilation, adhere to goal of plateau pressure <30 cm H ₂ O.					9 (90)
(18) If on controlled ventilation, adhere to low tidal ventilation (6-8ml/kg IBW).					9 (93)
(19) Adhering to the goal of a driving pressure of <18 if on controlled ventilation.					8 (76)
Initiating the protocol and determining oxygenation and ventilation goals:					
(20) Discussion on daily multidisciplinary rounds, including both oxygenation and ventilation goals, should occur.					9 (100)
(21) Goals around oxygenation and ventilation shall be documented by the RRT.					9 (97)
(22) Goals around oxygenation and ventilation shall be documented by the Intensivist/delegate.					9 (79)
The escalation of treatment modalities for HRF / ARDS should be based on:					
(23) Increasing FiO ₂ requirements.					9 (93)
(24) Worsening PF ratios.					9 (100)
(25) Increasing respiratory acidosis.					9 (90)
(26) Violation of lung protective ventilation (i.e. oxygenating or treating respiratory acidosis by using higher tidal volumes, higher plateau pressures, higher driving pressures than typically accepted).					8 (72)
Statements and qualifying criteria for items for monitoring in the management of HRF/ARDS					

(27) A plateau pressure should be measured on all patients with a controlled mode of ventilation regardless of PF ratio and FiO2 requirements, or lung compliance.						8.5 (77)
iv. How quickly should Pplat be measured after meeting criteria?	Within 1H	Within 2H	Within 3H	Within 4H		
	70%	17%	13%	0%		
v. How often should plateau pressures be measured?	Q4H	Q12H	Q12 or Q24 H	Other		
	68%	14%	10%	9%		
(28) The need for a plateau pressure maybe determined and enacted by the RRT/RN team, once the protocol is initiated by the physician team.						9 (85)
(29) A PEEP study should be completed Q4H only if patient has a certain PF ratio.						7 (55)
vi. If yes, what PF ratio range would justify the need for a PEEP study?	PF<100	PF<200	PF<300			
	0%	92%	8%			
vii. How quickly should the first PEEP study be completed?	Within1H	Within 2 H	Within 3H	Within 4H	Other	
	32%	11%	26%	5%	26%	
viii. How often should a PEEP study be completed?	Q12H	Q24H	Other			
	20%	70%	10%			
(30) The need for a PEEP study may be determined and enacted by the RRT/RN team, once the protocol is initiated by the physician team (similar to the TIBI protocol).						9 (76)
(31) The placement of an esophageal balloon should be considered to guide/determine both end inspiratory and end expiratory pressures (PEEP).						7 (71)
(32) The placement of an esophageal balloon to should be considered if patient is obese or is suspected to have a stiff chest wall.						9 (79)
(33) The need for an esophageal balloon is determined by the Intensivist/delegate team only.						9 (65)
(34) The need for an esophageal balloon may be determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.						7 (61)
Statements and qualifying criteria for items for basic interventions in the management of HRF/ARDS						
(35) Recruitment maneuvers should be assessed routinely for use in a care bundle for HRF/ARDS management.						7 (61)
ix. If being used, how often should recruitment maneuvers be done?	Q4H	Q12H	Other			
	38%	13%	50%			
(36) The need for recruitment maneuvers may be determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.						9 (86)
(37) Using sedatives to target a RASS of ≤-3 should be considered as a potential treatment modality for HRF/ARDS.						9 (82)
(38) The need for a sedation strategy is determined by the physician team only.						8 (65)
Statements and qualifying criteria for items for advanced interventions in the management of HRF/ARDS						
(39) The use of neuromuscular blockades should be considered as a potential treatment modality for HRF/ARDS.						9 (93)
(40) An ARDS protocol should have goals in relation to neuromuscular blockades (i.e. including train of four and other physiological parameters).						9 (90)
(41) When using Neuromuscular Blockades to manage HRF/ARDS: An ARDS care pathway should have preferred medications (i.e. use of Cisatracurium vs others).						9 (93)
(42) The use of neuromuscular blockades should be considered only if a patient has a certain PF ratio.						8 (90)
x. What PF ratio would you consider the use of paralytics?	PF<100	PF<150	PF<200	PF<300		
	0%	92%	8%	0%		
xi. What PF ratio necessitates the need for paralytics?	PF<100	PF<150	PF<200	PF<300		
	76%	5%	19%	0%		
(43) The need for neuromuscular blockades is determined by the physician team only.						9 (78)
(44) Proning a patient should be considered as a potential treatment modality for HRF/ARDS.						9 (100)

(45) Proning to manage HRF/ARDS should be considered only if a patient has a certain PF ratio.						9 (85)
	<i>xii. What PF ratio would you consider the need for proning?</i>	<i>PF<100</i>	<i>PF<150</i>	<i>PF<200</i>	<i>PF<300</i>	
		0%	45%	45%	0%	
	<i>xiii. What PF ratio would necessitate the need for proning?</i>	<i>PF<100</i>	<i>PF<150</i>	<i>PF<200</i>	<i>PF<300</i>	
		40%	25%	35%	0%	
(46) Proning to manage HRF/ARDS should be considered only if a patient has a specific FiO2 requirement?						7 (59)
	<i>xiv. If yes, what FiO2 requirement would need to be present to justify the need for proning?</i>	<i>FiO2>0.60</i>	<i>FiO2>0.80</i>	<i>FiO2>1</i>	<i>Refractory</i>	
		33%	58%	0%	8%	
(47) The need for proning a patient is determined by the physician team only.						7 (52)
(48) The need for proning a patient may be determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.						7 (70)
(49) The need for inhaled vasodilators is determined by the physician team only.						9 (76)
(50) ECMO should be considered as a potential treatment modality for HRF/ARDS.						9 (96)
(51) ECMO should be considered only if a patient has a certain PF ratio.						9 (79)
	<i>xv. What PF ratio would necessitate the need for ECMO?</i>	<i>PF<100</i>	<i>PF<150</i>	<i>PF<200</i>	<i>PF<300</i>	
		89%	11%	0%	0%	
(52) The need for ECMO is determined by the physician team only.						9 (93)

+Data for Statements are expressed as median, and percentage of consensus panelists agree (7-9) Likert scale.

**Data for qualifying criteria are expressed as percentage of consensus panelists agree.

HRF=hypoxemic respiratory failure. ICU=intensive care unit. PBW=predicted body weight. ICU=intensive care unit. H=hour. PF ratio=the ratio of arterial oxygen partial pressure to fractional inspired oxygen. Pplat=plateau pressures. PEEP=Positive End Expiratory Pressure. RRT=Registered Respiratory Therapist. RN=Registered Nurse. RASS=Richmond Agitation-Sedation Scale. ECMO=Extracorporeal Membrane Oxygenation.

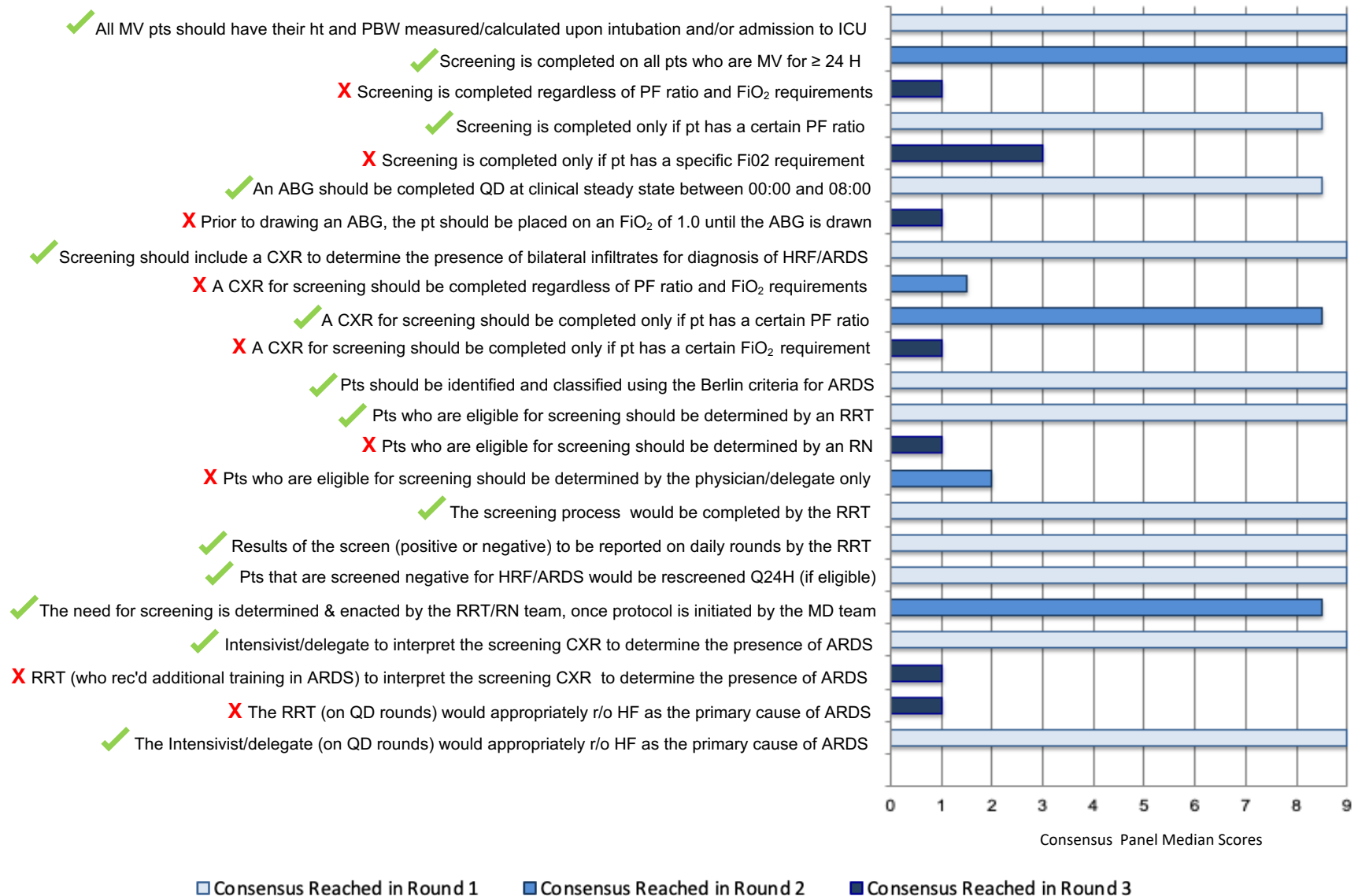


Figure 1. Consensus panel scores on 23 Statements on screening for HRF and ARDS, with the round in which consensus was achieved shown by color

The bars represent the median scores of consensus panel agreement on a 9-point Likert scale. Items reached consensus to exclude if median = 1-3, consensus to include if median = 7-9.

✓ = include. ✗ = exclude. MV=mechanically ventilated. Ht=height. PBW=predicted body weight. ICU=intensive care unit. Pts=patients. PF ratio=PF ratio of arterial oxygen partial pressure to fractional inspired oxygen. FiO₂=fraction of inspired oxygen. QD=daily. ABG=arterial blood gas. HRF=hypoxemic respiratory failure. ARDS=acute respiratory distress syndrome. QD=daily. CXR=chest x-ray. RRT=registered respiratory therapist. MD team=intensivist/delegate. r/o=rule out. HF=heart failure.

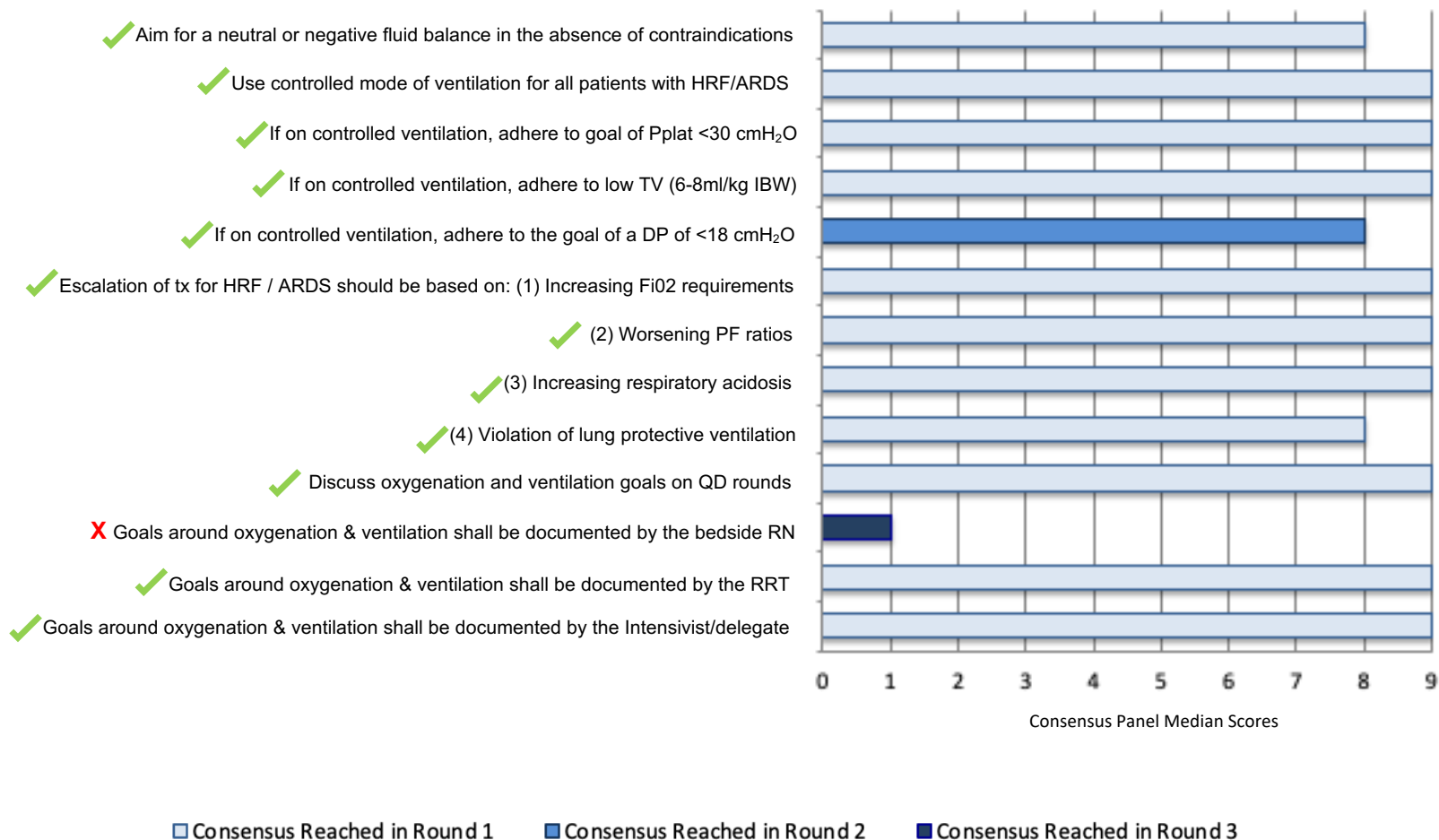


Figure 2. Consensus panel scores on 13 goals and early management Statements for HRF/ARDS, with the round in which consensus was achieved shown by color

The bars represent the median scores from a 9-point Likert scale. Items reached consensus to exclude if median = 1-3, consensus to include if median = 7-9.

✓ = include. ✗ = exclude. HRF=hypoxemic respiratory failure. ARDS=acute respiratory distress syndrome. Pplat=plateau pressure. TV=tidal volume. DP=driving pressure. FiO₂=fraction of inspired oxygen. PF ratio=PF ratio of arterial oxygen partial pressure to fractional inspired oxygen. QD=daily. RN=registered nurse. RRT=registered respiratory therapist.

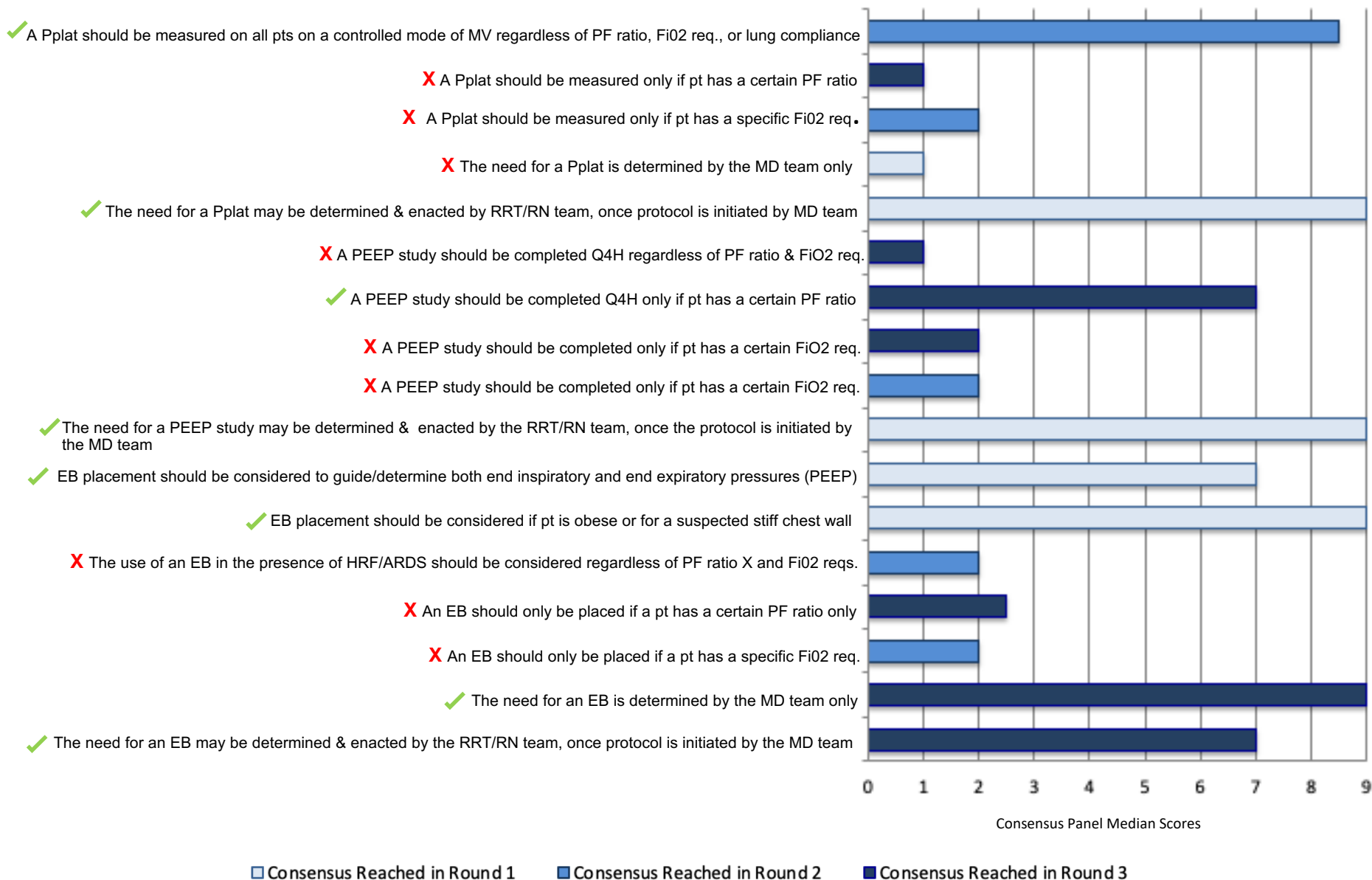


Figure 3. Consensus panel scores on 17 monitoring Statements for HRF/ARDS, with the round in which consensus was achieved shown by color

The bars represent the median scores from a 9-point Likert scale. Items reached consensus to exclude if median = 1-3, consensus to include if median = 7-9.

✓ = include. ✗ = exclude. Pplat=plateau pressure. PF ratio=PF ratio of arterial oxygen partial pressure to fractional inspired oxygen. FiO2=fraction of inspired oxygen. Reg=requirement. MD team=intensivist/delegate. PEEP=positive end expiratory pressure. Q4H=every 4 hours. EB=esophageal balloon. RRT=registered respiratory therapist. RN=registered nurse.

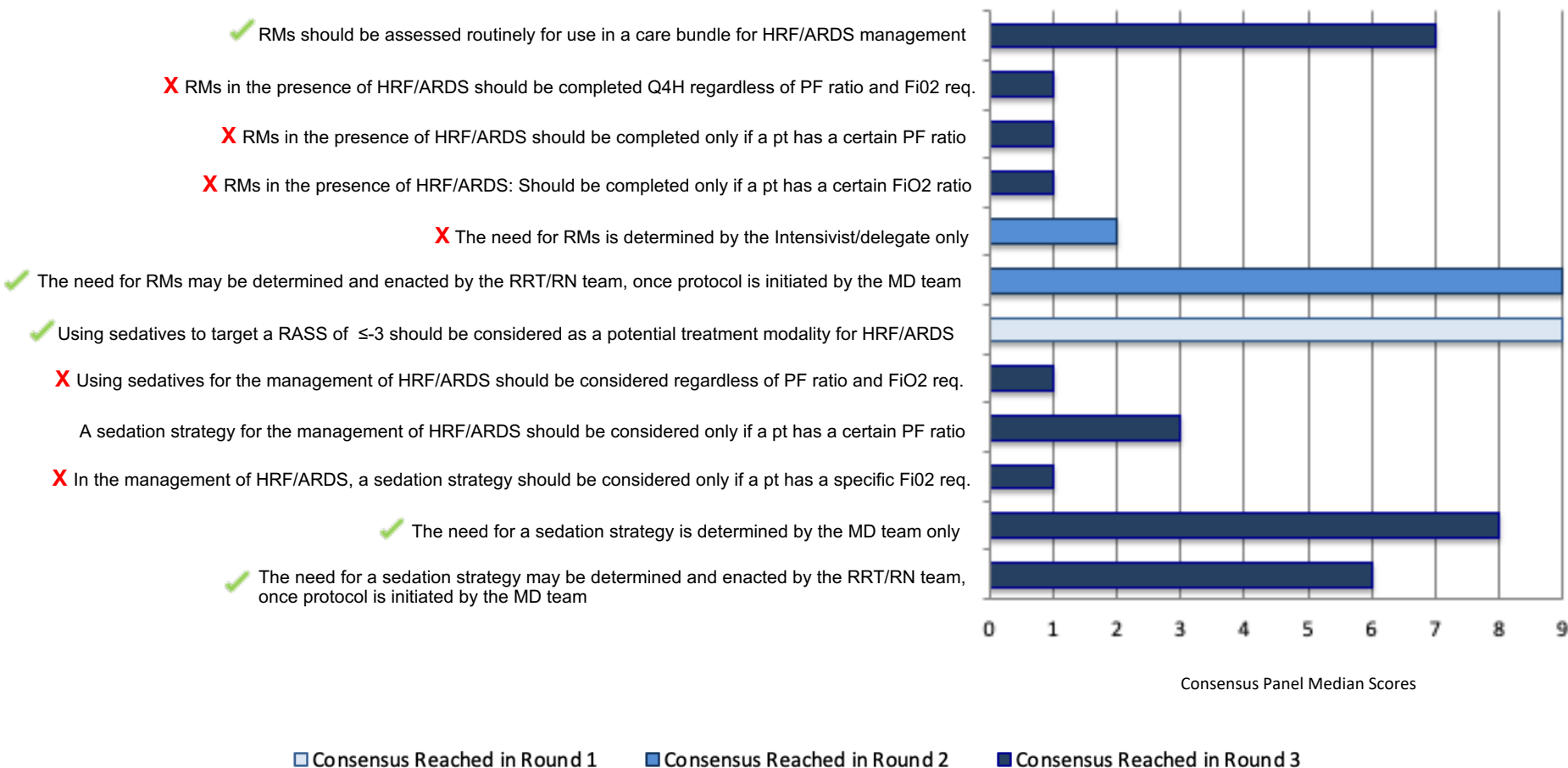


Figure 4. Consensus panel scores on 12 basic management items for HRF/ARDS, with the round in which consensus was achieved shown by color

Scores are medians from a 9-point Likert scale. Items reached consensus to exclude if median = 1-3, consensus to include if median = 7-9.

✓=include. ✗=exclude. RMs=recruitment maneuvers. HRF=hypoxemic respiratory failure. ARDS=acute respiratory distress syndrome. PF ratio=PF ratio of arterial oxygen partial pressure to fractional inspired oxygen. FiO2=fraction of inspired oxygen. RASS= Richmond Agitation and Sedation Scale. Pt=patient. MD team=intensivist/delegate.

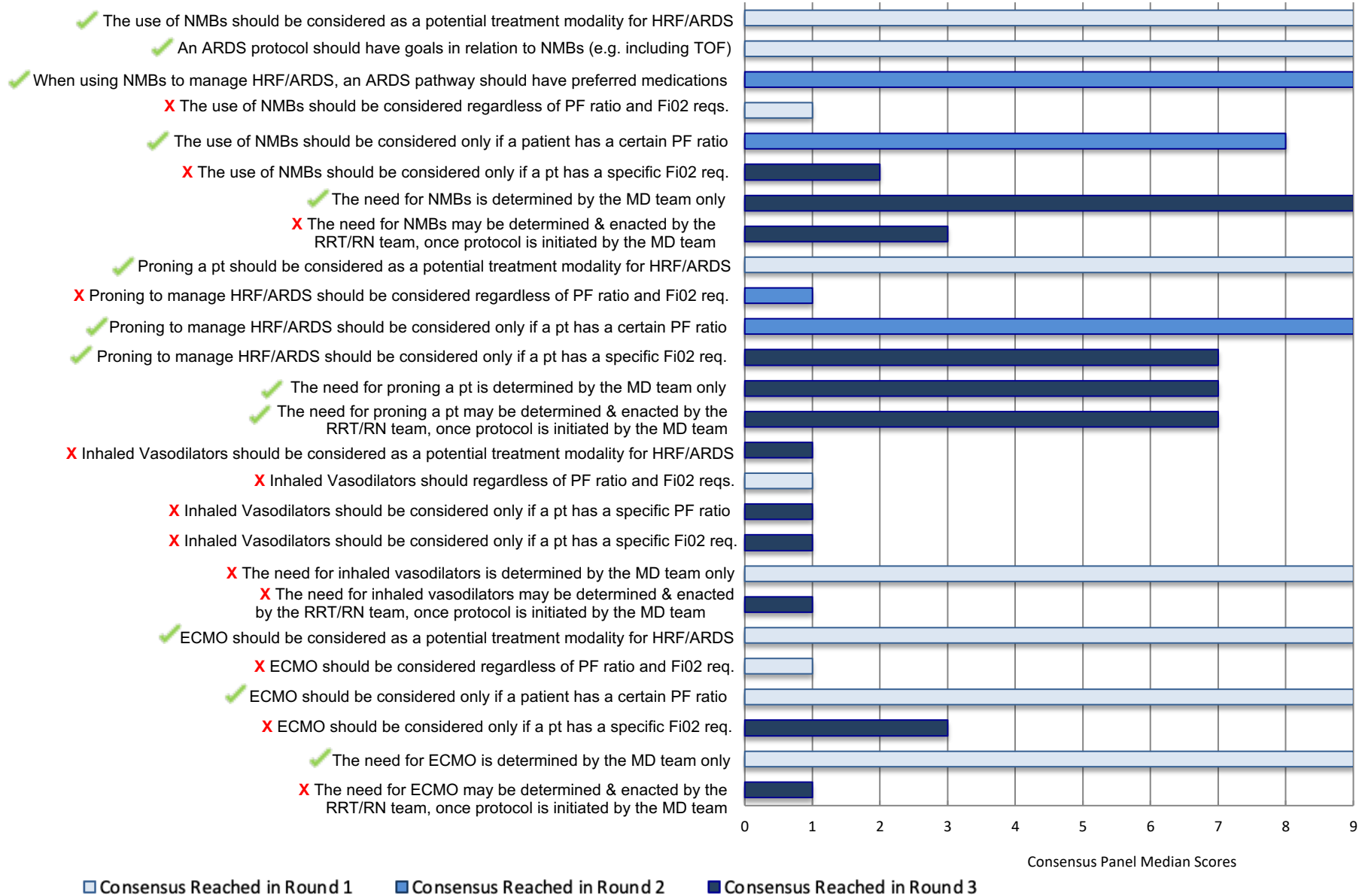


Figure 5. Consensus panel scores on 26 advanced management Statements for HRF/ARDS, with the round in which consensus was achieved shown by color

Scores are medians from a 9-point Likert scale. Statements reached consensus to exclude if median = 1-3, consensus to include if median = 7-9.

✓=include. ✗=exclude. NMBs=neuromuscular blockades. ARDS=acute respiratory distress syndrome. TOF=train of four. HRF=hypoxemic respiratory failure. FiO2=fraction of inspired oxygen. PF ratio=PF ratio of arterial oxygen partial pressure to fractional inspired oxygen. MD team=intensivist/delegate. Pt=patient. RRT=registered respiratory therapist. RN=registered nurse. ECMO=extracorporeal membrane oxygenation.

Supplementary Digital Content 7.

Summary of HRF and ARDS Statements included by the expert panel in a modified Delphi consensus process by discipline

Statements for items for screening in HRF/ARDS	Median		
	MD/NP	RT	RN
(1) All mechanically ventilated patients should have their height and PBW measured / calculated upon intubation and / or admission to ICU.	9	9	9
Statements and QC for screening for HRF/ARDS			
(2) Screening is completed on all patients who are mechanically ventilated for ≥ 24 hours.	9	8.5	8
(3) Screening is completed only if patient has a certain PF ratio.	8	9	5.5
(4) An arterial blood gas (ABG) should be completed daily at clinical steady state between 00:00 and 08:00	7.5	8.5	9
(5) A chest x-ray should be completed as part of the screening process for diagnosis of HRF/ARDS and/or determine the presence of bilateral infiltrates (as per the Berlin definition).	9	9	9
(6) A chest x-ray for screening should be completed only if patient has a certain PF ratio.	8	9	5
(7) Patients should be identified and classified using the Berlin criteria for ARDS.	9	9	9
(8) Patients who are eligible for screening should be determined by an RRT.	9	9	9
(9) The screening process would be completed by the RRT.	9	9	9
(10) Results of the screen (positive or negative) to be reported on daily rounds by the RRT	9	9	9
(11) Patients that are screened negative for HRF/ARDS would be rescreened Q24H (if eligible)	9	9	7
(12) The need for screening is determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.	9	8.5	3.5
(13) Intensivist/delegate to interpret the chest x-ray completed for screening to determine the presence of ARDS.	9	8	9
(14) The Intensivist/delegate (on daily rounds) would appropriately r/o heart failure as the primary cause of ARDS	9	9	9
Statements for items for goals and early management of HRF/ARDS			
The goal of lung protective strategies / ventilation include:			
(15) Aiming for a neutral or negative fluid balance in the absence of contraindications (unstable hemodynamics, rising creatinine, hypovolemia).	8	8.5	9
(16) The use of controlled mode of ventilation for all patients with HRF/ARDS.	7.5	9	9
(17) If on controlled ventilation, adhere to goal of plateau pressure <30 cm H ₂ O.	9	9	9
(18) If on controlled ventilation, adhere to low tidal ventilation (6-8ml/kg IBW).	9	9	9
(19) Adhering to the goal of a driving pressure of <18 if on controlled ventilation.	7	9	N/A
Initiating the protocol and determining oxygenation and ventilation goals:			
(20) Discussion on daily multidisciplinary rounds, including both oxygenation and ventilation goals, should occur.	9	9	9
(21) Goals around oxygenation and ventilation shall be documented by the RRT.	9	9	9

(22) Goals around oxygenation and ventilation shall be documented by the Intensivist/delegate.	7.5	9	9
The escalation of treatment modalities for HRF / ARDS should be based on:			
(23) Increasing FiO2 requirements.	8.5	9	9
(24) Worsening PF ratios.	9	9	9
(25) Increasing respiratory acidosis.	9	9	9
(26) Violation of lung protective ventilation (i.e. oxygenating or treating respiratory acidosis by using higher tidal volumes, higher plateau pressures, higher driving pressures than typically accepted).	7.5	7	9
Statements & <i>Quality Criteria</i> for items for monitoring in the management of HRF/ARDS			
(27) A plateau pressure should be measured on all patients with a controlled mode of ventilation regardless of PF ratio and FiO2 requirements, or lung compliance.	8	9	6.5
(28) The need for a plateau pressure maybe determined and enacted by the RRT/RN team, once the protocol is initiated by the physician team.	9	9	9
(29) A PEEP study should be completed Q4H only if patient has a certain PF ratio.	7	3	N/A
(30) The need for a PEEP study may be determined and enacted by the RRT/RN team, once the protocol is initiated by the physician team (similar to the TIBI protocol).	8.5	9	9
(31) The placement of an esophageal balloon should be considered to guide/determine both end inspiratory and end expiratory pressures (PEEP).	7	7.5	7.5
(32) The placement of an esophageal balloon to should be considered if patient is obese or is suspected to have a stiff chest wall.	9	9	8
(33) The need for an esophageal balloon is determined by the Intensivist/delegate team only.	9	3	5
(34) The need for an esophageal balloon may be determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.	1	8	5
Statements & <i>Quality Criteria</i> for items for basic interventions in the management of HRF/ARDS			
(35) Recruitment maneuvers should be assessed routinely for use in a care bundle for HRF/ARDS management.	9	7	5
(36) The need for recruitment maneuvers may be determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.	9	9	9
(37) Using sedatives to target a RASS of ≤ -3 should be considered as a potential treatment modality for HRF/ARDS.	9	9	8
(38) The need for a sedation strategy is determined by the physician team only.	9	7	5
Statements & <i>Quality Criteria</i> for items for advanced interventions in the management of HRF/ARDS			
(39) The use of neuromuscular blockades should be considered as a potential treatment modality for HRF/ARDS.	9	8.5	9
(40) An ARDS protocol should have goals in relation to neuromuscular blockades (i.e. including train of four and other physiological parameters).	9	8.5	9
(41) When using Neuromuscular Blockades to manage HRF/ARDS: An ARDS care pathway should have preferred medications (i.e. use of Cisatracurium vs others).	9	9	9
(42) The use of neuromuscular blockades should be considered only if a patient has a certain PF ratio.	9	8.5	1
(43) The need for neuromuscular blockades is determined by the physician team only.	9	9	5
(44) Proning a patient should be considered as a potential treatment modality for HRF/ARDS.	9	9	9

(45) Proning to manage HRF/ARDS should be considered only if a patient has a certain PF ratio.	9	9	7
(46) Proning to manage HRF/ARDS should be considered only if a patient has a specific FiO2 requirement?	7	7	1
(47) The need for proning a patient is determined by the physician team only.	9	2	5
(48) The need for proning a patient may be determined and enacted by the RRT/RN team, once protocol is initiated by the physician team.	5	8	5
(49) The need for inhaled vasodilators is determined by the physician team only.	9	6	8
(50) ECMO should be considered as a potential treatment modality for HRF/ARDS.	9	9	9
(51) ECMO should be considered only if a patient has a certain PF ratio.	9	8	9
(52) The need for ECMO is determined by the physician team only.	9	7.5	9

+Data for Statements are expressed as median.

MD=physician. NP=Nurse Practitioner. RN=Registered Nurse. RT=Respiratory Therapist. HRF=hypoxemic respiratory failure. ICU=intensive care unit. PBW=predicted body weight. ICU=intensive care unit. H=hour. PF ratio=the ratio of arterial oxygen partial pressure to fractional inspired oxygen. Pplat=plateau pressures. PEEP=Positive End Expiratory Pressure. RRT=Registered Respiratory Therapist. RASS=Richmond Agitation Sedation Scale. ECMO=Extracorporeal Membrane Oxygenation.

Supplementary Digital Content 8.

Validation survey respondents' ability to rate and agreement among those able to rate HRF and ARDS pathway elements by Discipline

Pathway elements	% Agreement among those able to rate			% Able to rate		
	MD/NP	RT	RN	MD/NP	RT	RN
Within 1 hour of intubation/admission to ICU: all mechanically ventilated patients should have the following documented in the Electronic Medical Record:						
i. Height	100	96	90	94	98	92
ii. Predicted body weight (PBW)	98	98	97	92	96	88
SCREENING						
All patients who are mechanically ventilated for ≥ 24 hours AND have a PF ratio (paO ₂ /FiO ₂) <300 on ANY arterial blood gas (ABG) should be identified for screening for hypoxemic respiratory failure (HRF) / ARDS by the RRT	96	81	98	96	93	59
Screening for hypoxemic respiratory failure (HRF) should consist of an ABG performed at clinical steady state between 00:00 and 08:00 to demonstrate PF ratio <300 (on a minimum PEEP of 5)	93	87	97	90	91	46
Screening for ARDS should consist of the following 3 criteria:						
i. Meeting criteria for HRF (as in Question 12 above) plus:	96	95	99	100	94	60
ii. Bilateral infiltrates: Screening chest x-ray should be performed and interpreted by intensivist/delegate to determine the presence of bilateral infiltrates	100	97	98	100	98	73
iii. Absence of heart failure: Intensivist/delegate appropriately rules out heart failure as the primary cause of HRF	98	98	99	100	97	70
Results of the HRF/ARDS screen (positive or negative) should be reported on daily multidisciplinary rounds by the RRT	89	89	97	98	95	83
Patients that are screened negative for HRF/ARDS should be rescreened Q24H	86	64	81	92	90	69
GOALS AND EARLY MANAGEMENT						
In the absence of contraindications (e.g. unstable hemodynamics, rising creatinine, hypovolemia) target neutral or negative fluid balance	96	97	98	98	80	93
For all patients with new onset HRF/ARDS controlled mode of ventilation should be used (e.g. pressure / volume control)	84	78	92	91	97	71
On controlled ventilation the following initial "lung protective" goals should be targeted:						
i. Low tidal volume (6-8ml/kg PBW)	95	93	98	94	98	52
ii. Plateau pressure <30 cm H ₂ O	98	98	99	96	98	37
iii. Driving pressure of <18	81	80	99	79	76	23
Oxygenation and ventilation goals:						
i. Should be defined on patient admission and reviewed on daily multidisciplinary rounds	100	98	100	100	99	98
ii. Should be documented by the RRT (MetaVision) and intensivist/delegate (Sunrise Clinical Manager)	93	98	99	96	97	94
Escalation of treatment should be based on:						

i. Increasing FiO2 requirements	98	98	100	100	99	94
ii. Worsening PF ratio	98	94	99	98	98	81
iii. Increasing respiratory acidosis	83	94	100	98	98	93
iv. Violation of lung protective ventilation (e.g. oxygenating or treating respiratory acidosis by using higher tidal volumes, higher plateau pressures, higher driving pressures than typically accepted)	84	90	99	94	94	69
MONITORING						
Plateau Pressures:						
i. Plateau pressures should be measured on all patients with a controlled mode of ventilation (independent of PF ratio, FiO2 requirements, or lung compliance)	96	81	97	96	98	38
ii. Initial plateau pressures should be measured within 1H of inclusion to the protocol	95	91	98	94	95	34
iii. Should be repeated at least Q12H (consider Q4H)	100	87	99	89	98	35
RRT should determine appropriateness of measuring plateau pressures and complete	93	98	94	94	99	73
PEEP Study:						
i. A PEEP study should be completed for patients with a PF ratio <200	85	85	99	87	88	33
ii. First PEEP study should be completed within 4H of meeting threshold	86	83	98	79	86	33
iii. Should be repeated Q24H	80	58	94	85	83	33
A PEEP study may be proposed by any member of the multidisciplinary team. RRT should perform	76	80	88	87	92	67
Consider an esophageal balloon to guide/determine both end inspiratory and end expiratory transpulmonary pressures (PEEP) in particular if patient is obese or is suspected to have a stiff chest wall	82	94	90	72	72	29
Esophageal balloon may be proposed by any member of the multidisciplinary team; however, needs most responsible practitioner approval prior to initiation. RRT should perform	80	89	90	74	75	39
BASIC INTERVENTIONS						
Recruitment maneuvers:						
i. Should be routinely assessed for appropriateness	81	93	98	91	96	88
ii. If used, should be performed Q4H	54	63	75	74	92	62
Recruitment maneuvers may be proposed by any member of the multidisciplinary team; however, needs most responsible practitioner approval prior to initiation. RRT should perform	93	87	95	87	98	89
Consider using sedatives to a target RASS of ≤ -3 or to reduce ventilator dyssynchrony	93	94	94	94	95	97
Sedatives may be proposed by any member of multidisciplinary team; however, needs most responsible practitioner approval prior to initiation. RN should administer and meet sedation goals	96	99	99	100	98	99
ADVANCED INTERVENTIONS						
Neuromuscular blockade should be:						
i. Considered for patients with a PF ratio <150	95	92	99	87	85	53

ii. Necessitated for patients with a PF ratio <100	75	83	87	85	80	48
Goals for neuromuscular blockade (e.g. train of four or ventilator dyssynchrony) should be determined and documented in Sunrise Clinical Manager	95	99	96	87	74	71
Preferred medications (e.g. use of Cisatracurium vs others) should be provided to RN team	93	99	99	94	70	89
Neuromuscular blockade may be proposed by any member of the multidisciplinary team; however, needs most responsible practitioner approval prior to initiation. RN should administer and meet goals	100	98	99	98	93	99
Prone should be:						
i. Considered for patients with a PF ratio <200 AND FiO2 requirement >0.60	88	88	91	87	95	51
ii. Necessitated for PF ratio <150 AND FiO2 requirement >0.60, in the absence of contraindications	62	68	79	79	92	46
Prone may be proposed by any member of the multidisciplinary team; however, needs most responsible practitioner approval prior to initiation. Multidisciplinary team should enact	100	97	97	96	99	90
Routine use of inhaled vasodilators is not recommended; however, they are available on a case by case basis in exceptional circumstances						
ECMO should be considered as a potential treatment modality for HRF/ARDS only if a patient has a PF ratio <100 despite above therapies and in the absence of contraindications	84	85	78	81	68	30
Referral for ECMO May be proposed by any member of the multidisciplinary team; however, needs most responsible practitioner approval prior to initiation of referral	100	95	91	96	76	55

RN=Registered Nurse. RT=Respiratory Therapist. HRF=hypoxemic respiratory failure. PEEP=Positive End-Expiratory Pressure. FiO2=fraction of inspired oxygen. PF ratio=PaO2: FiO2 ratio. RASS=Richmond Agitation Sedation Scale. ECMO=extracorporeal membrane oxygenation.