A Consensus-Based Recommendation for Oxygenation Targets in Critically Injured Patients

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Conflicts of Interest

None.

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Disclaimer

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Thanks to all our expert participants! (some in audience now)

Methods

Ethics
» Submitted proposal to University of Colorado IRB → exempt survey determination

Survey
» Surveys on REDCap (Research Electronic Data Capture)
» Multi-stage Delphi consensus process
» Invited selected experts both military and civilian with experience in operational medicine, critical care, trauma, emergency medicine, and prehospital medicine to participate
Performed systematic review of available literature → provided to the expert participants

Expert Participants

LTC Tyson Becker  Jason Heukoxsa  LTC Ethan Miles
Jason Brimard  David Huang  Ernest Moore
COL Kevin Chung  Juan-Pablo Idrovo  Craig Neugard
Mitchell Cohen  COL Sean Keenan  LTC Timothy Nunez
Brian Cotton  Akram Khan  COL (ret) John Oh
Pratik Doshi  LTC Col Philip Mason  LTC Ted Redmon
Franklin Guertler  Robert McKown  LTC Jamie Reisburg
Todd Rice  LTC Stephen Rush  Martin Ruchowsky
Wekley Self  Jason Sperry  CDR Joshua Tolben
CDR Benjamin Walrath  Henry Wang  LTC Ramsey Wilson
Franklin Wright

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Results

Of the 31 invited experts, 26 completed the first round, 28 completed the second round, 27 completed the final round; all participated in at least one round.

- Round 1 → narrowed the potential SpO2 range to 88-100% and PaO2 to 60-300mmHg
- Only 20% noted changes based on presence of TBI or hemorrhagic shock
- Round 2 → narrowed to 90-96% and 60-100mmHg targets
- Lowest acceptable FIO2 21% (ambient air)
- Round 3 → 89% accepted the limits at 90-96% and upper limit of 100mmHg, 36% accepted lower at 60mmHg
- All accepted lowest FIO2 at 21%
- 33% recommended higher oxygenation for TBI and 11% for hemorrhagic shock
- Resource limited setting most recommended lower target of 88%

A. Agreement with Lower SpO2 Thresholds in Delphi Stage 2

B. Agreement with Lower PaO2 Thresholds in Delphi Stage 2
Conclusions

Consensus-based standard for oxygenation targets in critically injured patients

- SpO2 90-96% (88-96% with resource-limitations)
- PaO2 60-100 mmHg
- Lowest acceptable FiO2 21%
- Adjustments for TBI, burns, major hemorrhage, etc. likely not needed

Expert consensus \rightarrow\text{prospective, clinical validation needed}
The End

Questions?
Comments?
Feedback?

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