Decision Letter (JCQ-2025-0034)

From: [redacted]
To:
CC:
BCC:

Subject: Journal of Clinical Question - Decision on Manuscript ID JCQ-2025-0034

Body: 19-Nov-2025

Dear Dr Zhang,

Manuscript ID JCQ-2025-0034 entitled "Development and Evaluation of an ISO-Containerized Class III Clean Operating Room for Mobile Surgical Applications" which you submitted to the Journal of Clinical Question, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

The reviewer(s) have recommended publication, but also suggest some revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript.

To submit your revised manuscript, follow the below steps.
1. Access to https://mc.manuscriptcentral.com/jcq and log into the site.
2. Click "Author" at the top left of the screen at "Home" page.
3. Click "Manuscripts with Decisions" on Author Dashboard page.
4. Click "create a revision" on the manuscript you are going to revise.
5. The system creates your revision manuscript form. Provide your comments about the revised points at the response field, fill in on each field step by step as same as you did for the original submission, and submit your revised manuscript.
IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.
Your manuscript number has been appended to denote a revision.

You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Because we are trying to facilitate timely publication of manuscripts submitted to the Journal of Clinical Question, your revised manuscript should be uploaded as soon as possible. If it is not possible for you to submit your revision in a reasonable amount of time, we may have to consider your paper as a new submission.

Once again, thank you for submitting your manuscript to the Journal of Clinical Question and I look forward to receiving your revision.

Sincerely,
Richard Isaacs
Editor in Chief,
Journal of Clinical Question

[Editor's Comments]
Associate Editor
Comments to the Author:
1. Check grammar and flow for minor errors.
2. Ensure all abbreviations are defined on first use in both abstract and main text.
3. Add ORCID IDs for authors if available

[Reviewer(s)' Comments]
Reviewer: 1

Comments to the Author
The study presents a technically well-constructed prototype of a containerized Class III clean operating room. The research is highly practical and aligns with current global interests in portable medical infrastructure. The manuscript is generally concise and informative, but certain sections could be strengthened for technical depth.
1. The average supply velocity (0.08 m/s) fell below the 0.1–0.4 m/s requirement. The authors note that the air-change rate compensates for this, but a more detailed engineering explanation (e.g., diffuser design, airflow uniformity, turbulence intensity) is needed to justify the adequacy of the system.
2. Noise levels exceeded the limit by a significant margin. It would be valuable to distinguish between mechanical noise (compressor, fans) and structural vibrations. This could guide future interventions and indicate whether the problem is inherent to container architecture.
3. The observed humidity (69%) surpasses the accepted range. The authors should elaborate on whether this is due to regional climate conditions at the time of testing, equipment limitations, or container insulation constraints.
4. No statistical treatment (e.g., variance, standard deviation) is provided for repeated measurements. While this is engineering data, presenting variability would enhance the robustness of the findings.
5. The manuscript states that surgical equipment is included; however, the potential impact of heat-generating devices (monitors, cautery units, anesthesia machines) on temperature/humidity regulation is not discussed.

Reviewer: 2

Comments to the Author
This manuscript presents the development and performance evaluation of a Class III clean operating room built inside an ISO-standard container. The work addresses a relevant need in disaster relief, military medicine, and remote surgical care. The concept is timely, and the technical assessment is clearly structured. The findings demonstrate the feasibility of the proposed mobile surgical unit, although several environmental parameters remain suboptimal. The manuscript is generally well written but would benefit from expanded methodological clarity, deeper comparative analysis, and a more critical interpretation of results.
Major Comments 1
Although airflow, temperature, humidity, and noise assessments are described, the description of instrumentation and calibration could be more rigorous. For example, details such as calibration dates, accuracy ranges, and environmental conditions during testing would improve reproducibility.
Major Comments 2
Humidity (69%) and noise levels (54.6 dB(A)) exceeded Class III requirements. The discussion acknowledges this but does not sufficiently address potential clinical consequences or mitigation strategies (e.g., noise-control engineering, dehumidification options). Strengthening this section would underscore the importance of optimization.
Major Comments 3
Performance measurements were conducted in static conditions without personnel flow or surgical activity. Since real-world operation may significantly alter particulate loads and pressure differentials, the authors should acknowledge this limitation more explicitly and recommend simulated clinical testing in future studies.
Major Comments 4
The evaluation relies solely on particle concentration as a proxy for sterility. While technically acceptable, the manuscript should discuss the lack of microbiological surveillance and its implications for evaluating infection-control performance.
Major Comments 5
Table S1 provides an overview of other mobile surgical units, but the discussion could more clearly articulate how the present design compares in performance, mobility, and compliance. A dedicated subsection or expanded narrative would enhance the study's contextual value.
Minor Comments
1. Figures S1 and S2 should include scale indicators to facilitate spatial interpretation.
2. Some tables (e.g., Table 2 and Table 3) would benefit from clearer formatting and column alignment for readability.
3. The introduction could reference more recent MSU designs used in humanitarian interventions to reinforce the significance of the work.

Date Sent: 19-Nov-2025

Author's Response to Decision Letter for (JCQ-2025-0034)

Development and Evaluation of an ISO-Containerized Class III Clean Operating Room for Mobile Surgical Applications

Dear Reviewers,
We sincerely thank both reviewers for their constructive and insightful comments. Their feedback has significantly improved the technical rigor, clarity, and contextual depth of the manuscript. Below, we provide a detailed, point-by-point response.

Reviewer 1
Comment 1: The average supply velocity (0.08 m/s) fell below the 0.1–0.4 m/s requirement. The authors note that the air-change rate compensates for this, but a more detailed engineering explanation (e.g., diffuser design, airflow uniformity, turbulence intensity) is needed to justify the adequacy of the system.
Response: Thank you for this important observation. We have expanded the discussion to clarify the engineering basis for system adequacy: "The large-area, low-velocity diffusers were designed to distribute air uniformly and deliver the required volumetric flow without creating drafts, promoting adequate mixing and minimizing stagnant zones. Turbulence intensity near the diffuser outlets also remained within acceptable limits, indicating stable flow introduction. Together, these characteristics compensate for the lower supply velocity and support the adequacy of the ventilation system."

Comment 2: Noise levels exceeded the limit by a significant margin. It would be valuable to distinguish between mechanical noise (compressor, fans) and structural vibrations. This could guide future interventions and indicate whether the problem is inherent to container architecture.
Response: We agree that distinguishing noise sources is essential. The manuscript has been updated as follows: "Distinguishing between mechanical noise (from the compressor and fans) and structurally transmitted noise is important for identifying the root cause. Our observations indicate that both direct mechanical sound and vibration-induced transmission through the container's lightweight steel panels contribute to the elevated noise levels. Mechanical noise may be mitigated through equipment isolation or fan-speed adjustments, whereas structurally borne noise may require architectural interventions such as panel stiffening or the addition of sound-absorbing materials. Addressing these pathways will help guide future system and structural improvements."

Comment 3: The observed humidity (69%) surpasses the accepted range. The authors should elaborate on whether this is due to regional climate conditions at the time of testing, equipment limitations, or container insulation constraints.
Response: Thank you for your comment. We have expanded the discussion to address potential contributing factors: "This elevated humidity appears partly attributable to regional climatic conditions during the testing period, as high outdoor moisture levels imposed an additional load on the system. Equipment-related factors, particularly the limited dehumidification capacity of the compact purification unit, likely contributed as well. Moreover, characteristics inherent to the container structure, including low thermal mass and modest insulation thickness, may have reduced moisture buffering and allowed greater humidity ingress. These combined influences indicate that future designs may benefit from enhanced dehumidification capability, improved insulation, or supplemental climate-control measures to maintain optimal indoor humidity under varying environmental conditions."

Comment 4: No statistical treatment (e.g., variance, standard deviation) is provided for repeated measurements. While this is engineering data, presenting variability would enhance the robustness of the findings.
Response: We appreciate this suggestion. We have included descriptive statistics (mean and standard deviation) for all repeated measurements to improve the robustness and interpretability of the data.

Comment 5: The manuscript states that surgical equipment is included; however, the potential impact of heat-generating devices (monitors, cautery units, anesthesia machines) on temperature/humidity regulation is not discussed.
Response: We agree. The limitations section has been updated as follows: "A further limitation is that the potential influence of heat-generating surgical equipment, such as monitors, electrocautery units, and anesthesia machines, on the room's temperature and humidity regulation was not evaluated in this study, despite their likely contribution to additional thermal loads and moisture fluctuations."

Reviewer 2
Major Comment 1: Although airflow, temperature, humidity, and noise assessments are described, the description of instrumentation and calibration could be more rigorous. For example, details such as calibration dates, accuracy ranges, and environmental conditions during testing would improve reproducibility.
Response Thank you for this comment. We have strengthened the Methods section as follows: "Airflow, temperature, humidity, and noise measurements were obtained using calibrated instruments with documented accuracy ranges. All devices were verified prior to testing, with calibration dates recorded according to manufacturer specifications. Measurements were conducted under stable environmental conditions, and instruments were allowed to equilibrate before data collection. Data from multiple tests are presented as the mean and standard deviation."

Major Comment 2: Humidity (69%) and noise levels (54.6 dB(A)) exceeded Class III requirements. The discussion acknowledges this but does not sufficiently address potential clinical consequences or mitigation strategies (e.g., noise-control engineering, dehumidification options). Strengthening this section would underscore the importance of optimization.
Response: We appreciate this recommendation. As the same as Reviwer 1 pointed out., We have expanded the discussion: "This elevated humidity appears partly attributable to regional climatic conditions during the testing period, as high outdoor moisture levels imposed an additional load on the system. Equipment-related factors, particularly the limited dehumidification capacity of the compact purification unit, likely contributed as well. Moreover, characteristics inherent to the container structure, including low thermal mass and modest insulation thickness, may have reduced moisture buffering and allowed greater humidity ingress. These combined influences indicate that future designs may benefit from enhanced dehumidification capability, improved insulation, or supplemental climate-control measures to maintain optimal indoor humidity under varying environmental conditions." "Distinguishing between mechanical noise (from the compressor and fans) and structurally transmitted noise is important for identifying the root cause. Our observations indicate that both direct mechanical sound and vibration-induced transmission through the container's lightweight steel panels contribute to the elevated noise levels. Mechanical noise may be mitigated through equipment isolation or fan-speed adjustments, whereas structurally borne noise may require architectural interventions such as panel stiffening or the addition of sound-absorbing materials. Addressing these pathways will help guide future system and structural improvements."

Major Comment 3: Performance measurements were conducted in static conditions without personnel flow or surgical activity. Since real-world operation may significantly alter particulate loads and pressure differentials, the authors should acknowledge this limitation more explicitly and recommend simulated clinical testing in future studies.
Response: We agree completely. A new limitation has been added: "Measurements were obtained under controlled, non-clinical conditions, meaning that the performance of the unit under real-world operating scenarios, where door openings, personnel movement, and equipment use may alter airflow and particulate loads, remains untested."

Major Comment 4: The evaluation relies solely on particle concentration as a proxy for sterility. While technically acceptable, the manuscript should discuss the lack of microbiological surveillance and its implications for evaluating infection-control performance.
Response: Thank you for your comment. The limitations section has been revised accordingly: "Additionally, the study did not assess microbial contamination directly, focusing instead on surrogate markers such as particle concentration and airflow. While these are standard engineering metrics, they cannot fully substitute microbiological monitoring, which is essential to validate infection control performance. The reliance on a single prototype further limits generalizability, as manufacturing variations and operational wear could affect long-term performance."

Major Comment 5: Table S1 provides an overview of other mobile surgical units, but the discussion could more clearly articulate how the present design compares in performance, mobility, and compliance. A dedicated subsection or expanded narrative would enhance the study's contextual value.
Response: Thank you for your comment on this point. We have revised the discussion as follows: "Relative to existing MSUs, the container-based system exhibits competitive performance in ventilation, particulate control, and illumination while remaining compact and rapidly deployable. Its modular footprint and compatibility with standard logistics infrastructure further enhance mobility compared with trailer- or bus-mounted systems. The unit also satisfies several compliance criteria for emergency healthcare facilities."

Minor Comments 1. Figures S1 and S2 should include scale indicators to facilitate spatial interpretation.
Response Thank you for your commnet on this point. Scale indicators have been added to both figures.

Minor Comments 2. Some tables (e.g., Table 2 and Table 3) would benefit from clearer formatting and column alignment for readability.
Response Thank you for your comment on this point. Tables 2 and 3 have been reformatted to improve clarity and column alignment.

Minor Comments 3. The introduction could reference more recent MSU designs used in humanitarian interventions to reinforce the significance of the work.
Response Thank you for your comment on this point. The Introduction has been updated to include recent MSU deployments in humanitarian and remote-care settings.

We sincerely thank both reviewers for their valuable feedback. The revisions have substantially strengthened the manuscript's scientific rigor, clarity, and overall contribution to the field of mobile surgical environments.

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