

INTRODUCTION

- The ongoing evidence on the importance of Non-invasive ventilation (NIV) use in acute and chronic respiratory failure has highlighted the genuine need to develop a structured, standardized NIV education and training to develop advanced operator skills. However, of what we know, there is no standardized NIV curriculum for rapid mastery.

Objective

- Our objective is to create a standardized NIV curriculum using E-Learning modules and evidence based bedside practices for PCCM fellows.

Design

1-Pre-test: A) Baseline written modified with less complexity (MCQs)-Knowledge test. B) A pre- training confidence survey.

2-Intervention:

A) Four E-learning evidence-based modules using animated characters for patients and providers focused on NIV use in the settings of acute and chronic respiratory failure and sleep medicine with interactive scenarios and embedded quizzes. Total time of 166 minutes.

B) One-hour didactics were conducted, focusing on indications of NIV other than the clinical scenarios discussed in the E-modules
C) 30-minute knobology session and bedside clinical application of NIV settings.

3-Post-test: A)written knowledge post-test done 4 weeks from baseline testing.

B)A post training confidence survey using a 5 points Likert scale for subjective evaluation.

Results

- In July 2022, 8 first year PCCM fellows completed the training of a total duration of 166 minutes (about 3 hours).
- The average MCQ score increased from 13.5 ± 3.2 to 18.37 ± 1.6 (Maximum of 25), which equated to about 36% improvement ($P < 0.05$) (figure 1).
- The confidence survey also revealed improved learner confidence in all competencies with statistical significance ($P < 0.05$) (Table 1).

Figures

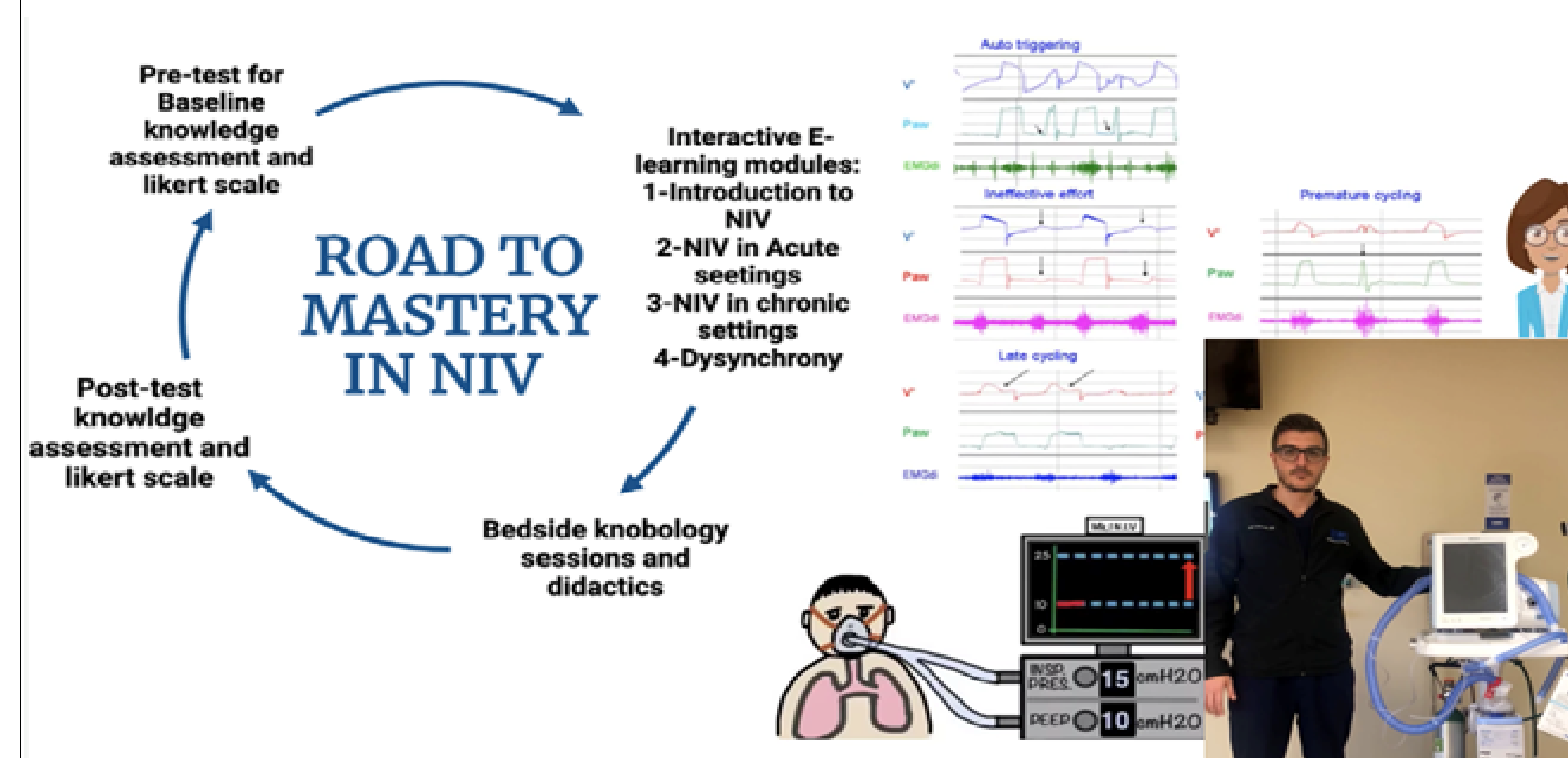


Figure 1: Box and whisker plt depicting improvement of the median scores for the MCS-based knowledge test after four weeks of implementation of the E -curriculum (P value < 0.05).



Figure (1)

Table (1)

Table 1: Mean and standard deviation of Pre and post training survey using 5-point Likert scale, with 5 as extremely comfortable. It showed self-reported improvement of in competencies related to the management of NIV in the different clinical settings, chronic and acute respiratory failure.
*P value < 0.05

NIV competency subjects	Pre-training Mean \pm SD	Post-training Mean \pm SD
NIV management in COPD exacerbation	3.1 \pm 0.8	4.4 \pm 0.5*
NIV management in pulmonary edema	3.3 \pm 0.7	4.1 \pm 0.6*
Patient's selection for NIV initiation in ICU	3.4 \pm 1.1	4.6 \pm 0.5*
Choosing appropriate NIV mode for different clinical scenarios in ICU	2.5 \pm 0.9	4.1 \pm 0.6*
Titration of NIV settings in ICU	2.3 \pm 0.9	4.5 \pm 0.5*
Liberation from NIV in ICU	3.1 \pm 1.1	3.6 \pm 1.2
Management of NIV in chronic hypercapnic respiratory failure in COPD	2.8 \pm 1.0	4.1 \pm 0.6*
Patients' selection for long term home NIV	2.6 \pm 1.1	4.0 \pm 0.5*
Choosing appropriate NIV mode for different clinical scenarios for long term home NIV	2.5 \pm 1.1	4.0 \pm 0.5*
Titration of NIV settings and follow up in outpatient settings	2.3 \pm 0.9	4.3 \pm 0.4
Troubleshooting of NIV issues, such as leak and mask discomfort	2.3 \pm 1.0	4.3 \pm 0.9*

Conclusions

- E-learning is one of the new methods of education which is easily accessible and reproducible over the years. This Internet based curriculum that focused on the NIV use for PCCM trainees and included videos of clinical case scenarios with animated characters, didactics, and bedside small group and knobology sessions, showed improvement in the knowledge and confidence in NIV use for the PCCM fellows.