

Survey of Ventilator Waveform Interpretation Among ICU Professionals



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Background

- Ventilator waveform interpretation is essential for effective and safe mechanical ventilation (MV), but requires specialized training and expertise.
- This study aimed to investigate the ability of ICU professionals to interpret ventilator waveforms, identify areas requiring further education and training, and explore the factors influencing interpretation skills.

Methods

- An online anonymous questionnaire survey was distributed through WeChat and Twitter, from 02/07/23 to 03/02/23.
- Survey respondents: ICU professionals (physicians, nurses and RTs) with ≥ 1 year ICU experience and caring for MV patients in the month before survey started.
- Survey content:
 - demographic information
 - 15 multiple-choice questions on ventilator waveforms

Results

- 1,832 professionals from 31 countries or regions completed the survey.
- 53% answered $\geq 60\%$ of the questions correctly (Fig 1).
- Top 3 questions with correct answers (Fig 2):
 - condensation
 - pressure overshoot
 - bronchospasm
- Top three “hard” questions:
 - early cycle leading to double trigger
 - severe under assistance (flow starvation)
 - early/reverse trigger
- Factors significantly associated with $\geq 60\%$ correct answers (Table):
 - years of ICU working experience (≥ 10 years)
 - profession (respiratory therapist)
 - highest degree earned (graduate)
 - work place (teaching hospital)
 - prior MV waveforms training

Table. Association of Training, Experience, and Profession With the odds of identifying $\geq 60\%$ correct answers

Influential factors	OR	95%CI	P value
Years of ICU work experience (≥ 10 yr)	1.6	1.2-2.0	< .001
Profession (RT)	2.8	2.1-3.7	< .001
Degree (Graduate)	1.7	1.3-2.2	< .001
Teaching hospital	1.4	1.1-1.7	.008
MV waveform training	1.7	1.3-2.2	< .001

Figure 1. The percentage of questions answered correctly by the participants.

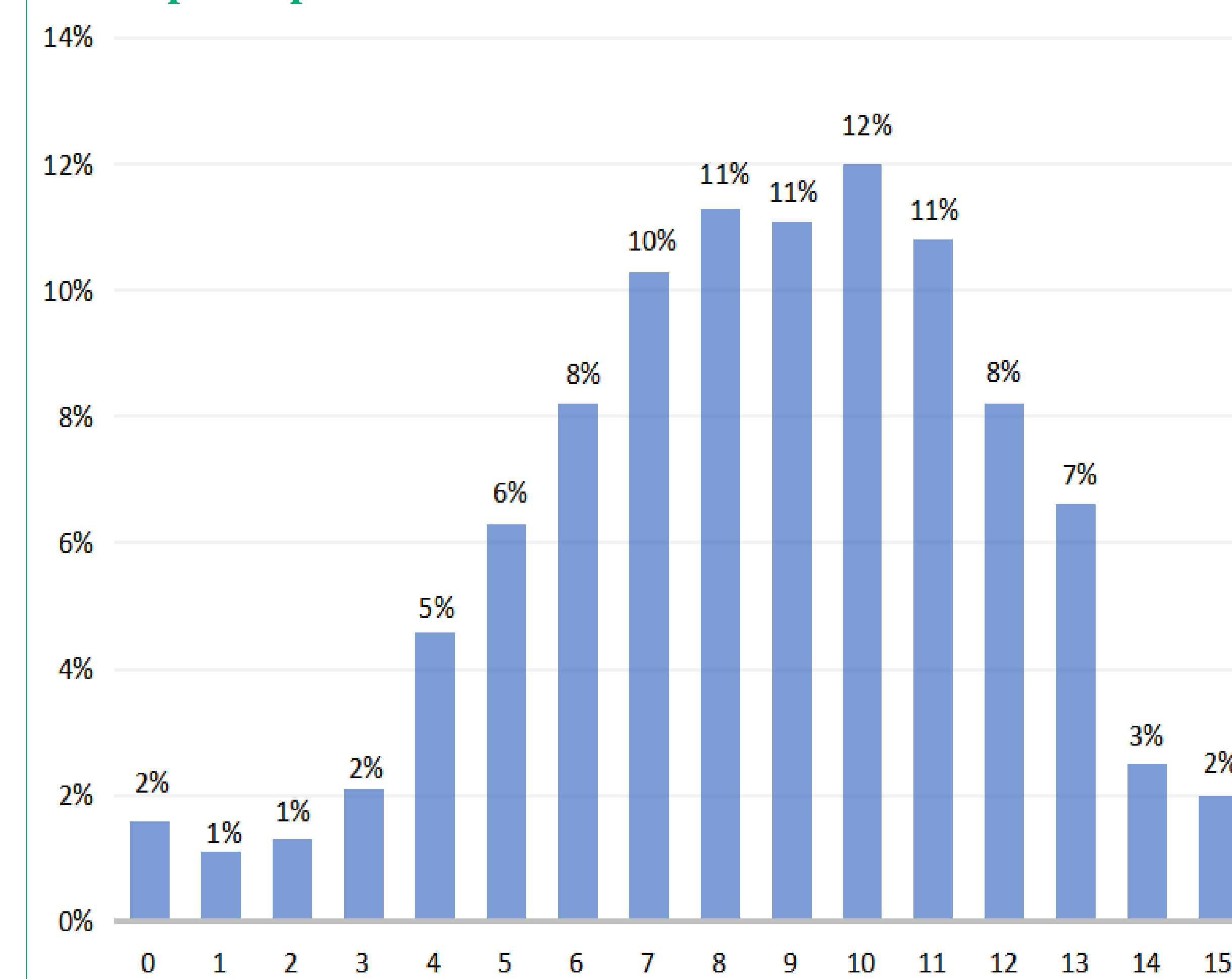
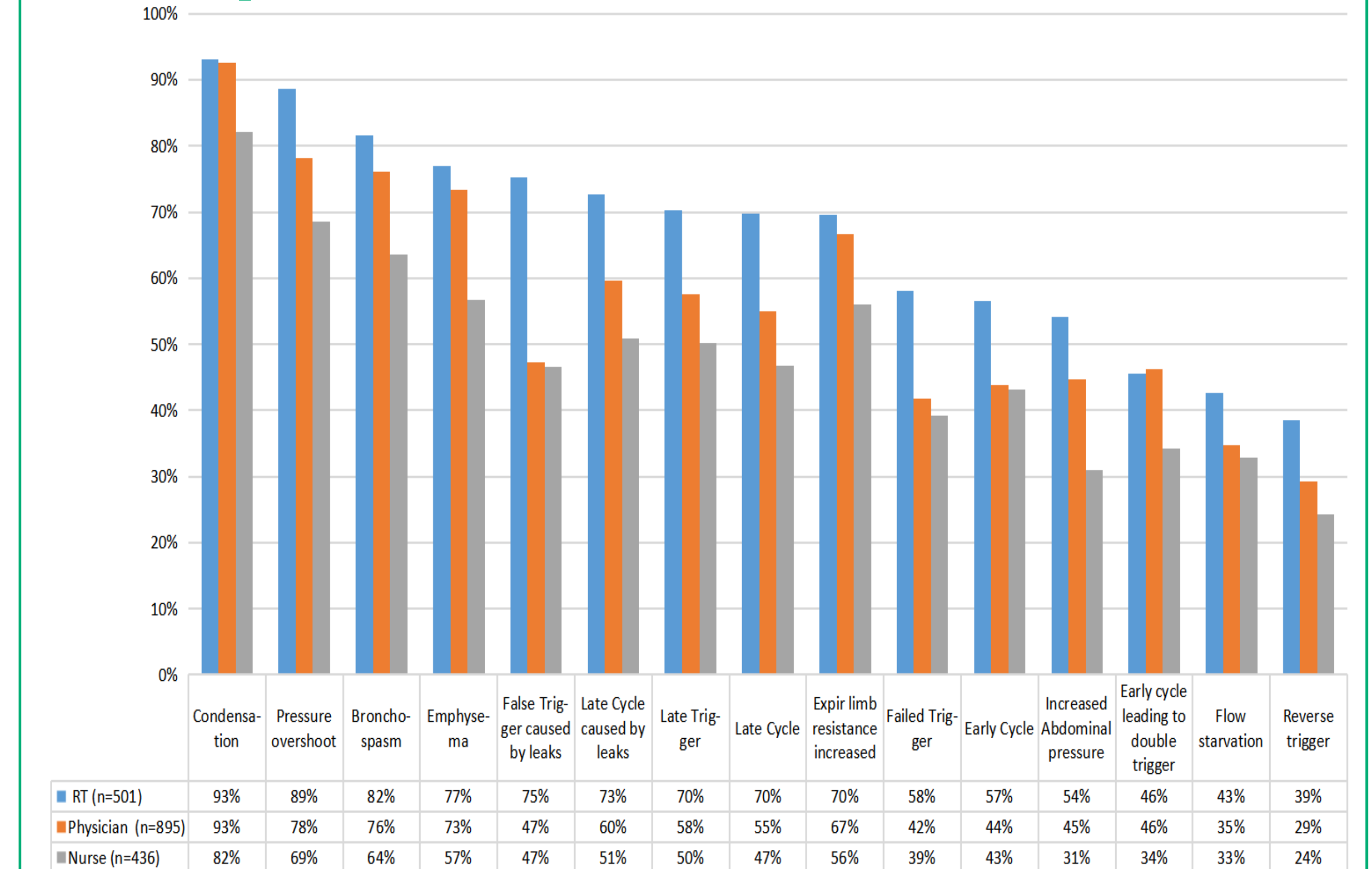


Figure 2. The percentage of accuracy rate by the participants from different professions.



Conclusion

- Slightly over half ICU professionals correctly identified $\geq 60\%$ ventilator waveforms.
- High performance was associated with years of ICU working experience, profession, highest degree earned, workplace, and ventilator waveforms training.
- Some waveforms were poorly recognized across all groups of surveyed professionals.

Disclosures

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