Table 2
EM relevance of Included Guidelines (n = 16).

Relevance domain	Guideline specifics
Practice recommendations (level of supporting evidence)	ICSI 2016 (Rec 13.8) – Use of drug monitoring programs prior to EM opioid prescribing (weak) Canadian NOUGG 2010 (Rec 24) – Limited prescribing of opioids in EM, consulting pharmacy/primary care resources, creating EM-specific policies (weak)
Author involvement (conflict of interest)	ICSI 2016–1 EM physician (no conflicts) Canadian NOUGG 2010 – 1 EM physician (significant conflict) APS AAPM 2009 – 1 EM physician (unclear conflict)
EM external review (physicians, nurses, prehospital)	None

practice. Furthermore, such recommendations are inherently most valid and reliable when they have been constructed with appropriate stakeholder involvement as the assumption would be that they would have specific knowledge of the clinical setting and the nuances surrounding the practice [14]. In this review, the near absence of EM-relevant recommendations reflects the lack of meaningful input from EM stakeholders (physicians, nurses, prehospital personnel). In the absence of contributions from EM stakeholders during guideline construction, it is desirable to have the draft guidelines reviewed by EM expert organizations prior to final publication to ensure meaningful feedback. Such external review was not found during any phase of development in the guidelines included in this review.

In the absence of useful EM-relevant recommendations from international opioid prescribing guidelines, some specialty-specific organizations have tried to fill the void. The American College of Emergency Physicians (ACEP) published a specific clinical policy for prescribing short-acting opioids in limited acute and chronic pain conditions for adults in the EM [15]. Various regional jurisdictions and cities have tried to enact local ED opioid prescribing guidelines with variable supporting evidence and success [16-20]. These reports were not included in this review, as they did not meet inclusion criteria.

In conclusion, international and pain specialty organization opioid prescribing guidelines have few relevant recommendations for EM practice, and any supporting evidence is weak. Emergency practitioners rarely participate in authorship groups, nor in external review of draft documents prior to final publication. This study reinforces the need for EM organizations to create guidance documents around opioid prescribing for EM practitioners, and involving appropriate EM authors and stakeholders.

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Effect of lumbar elevation on dilatation of the central veins in normal subjects

The subclavian vein (SCV) and internal jugular vein (IJV) are commonly used to obtain central venous access [1]. In general, a small IJV (area ≤ 0.4 cm^2) was reported in 5–14.6% of healthy subjects [2, 3] and 23% of patients [2]. Moreover, the maximum IJV area was 0.2 cm^2 in dehydrated subjects [4]. A small IJV diameter measuring ≤7 mm was shown to lead to catheterization failure (14.9%) and complications (8.5%) [5].

On this account, techniques that facilitate successful central line placement, such as the Trendelenburg position (TP) and Valsalva maneuver, may be required [6]. Both techniques may improve the chance of successful cannulation.

However, the issues reported were that a cheap or non-functioning bed could not change the patients' position to the TP and that patients find it difficult to hold their breath for the Valsalva maneuver (disobedient or uncooperative patients especially) throughout central line placement.

This study aimed to determine the body position that can result in the largest diameter of the central veins on an ordinary bed for cannulation.

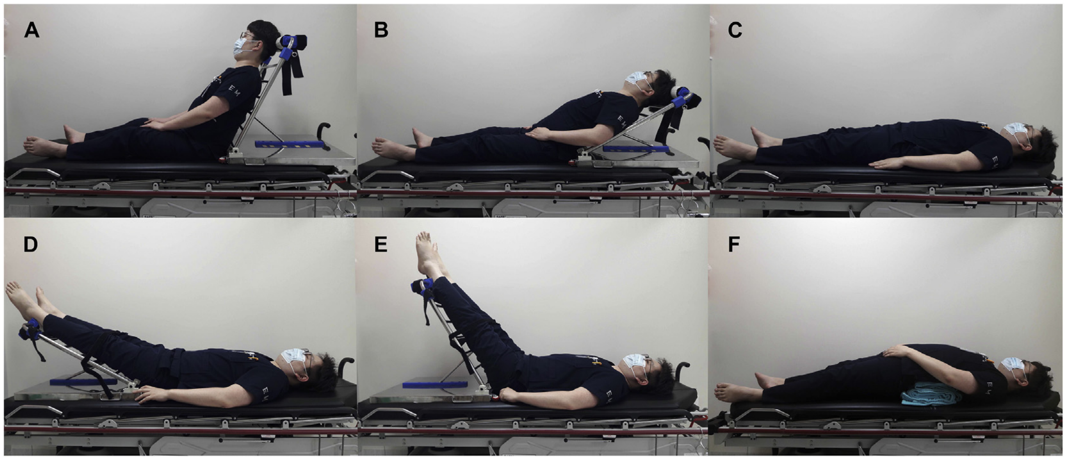

Fig. 1. Subject's positions.A, upper body 60° elevation. B, upper body 30° elevation. C, supine position. D, lower body 30° elevation. E, lower body 60° elevation. F, lumbar elevation.

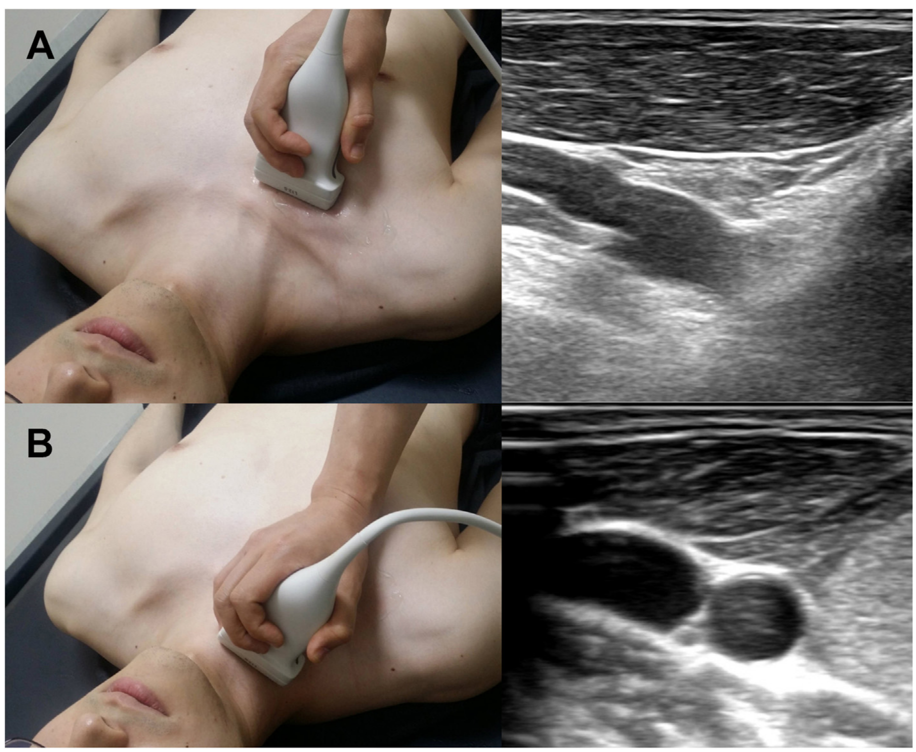

Fig. 2. Ultrasonographic measurement.A, subclavian vein. B, internal jugluar vein.

Table 1
Comparison of central vein diameter repeatedly measured in each body position.

	+60°	+30°	Supine 0°	30°+	60°+	LE (−15°)
SCV max (mm)	7.7 ± 1.91	7.9 ± 1.96	10.1 ± 2.43	10.1 ± 1.69	10.3 ± 1.94	10.7 ± 1.72
SCV min (mm)	6.8 ± 1.95	6.9 ± 2.32	9.2 ± 2.42	9.4 ± 1.76	9.5 ± 2.16	10.1 ± 1.97
IJV max (mm)	3.8 ± 1.45	5.1 ± 1.98	8.7 ± 2.37	8.4 ± 2.09	8 ± 2.27	9.8 ± 2.29
IJV min (mm)	3.1 ± 1.41	4.5 ± 2	7.2 ± 2.19	7 ± 2	6.7 ± 2.18	8.4 ± 2.52

Values are expressed as the mean (±standard deviation), SCV, Subclavian vein; IVC, inferior vena cava; IJV, internal jugular vein; +60°, 60° elevation in upper-body; +30°, 30° elevation in upper body; 30° + 30° elevation in lower body; 60°+, 60° elevation in lower body; LE, lumbar elevation.

After obtaining approval from the local ethics committee (ref. no.: DAUHIRB-16-161), we enrolled 30 healthy young male subjects between August 2016 and June 2017.

Each subject was placed in 60° and 30° upper body elevation, supine position, and 30° and 60° lower body elevation. Lumbar elevation (LE) was consecutively performed (Fig. 1). The procedure was performed by a position changer that can set the proper angle at 30° or 60°. In LE, the upper body was lowered to >20 cm, and the head was tilted downward, with the lumbar region elevated by a pillow or a blanket and the abdomen slightly strained. The maximum and minimum vertical diameters of the central vein were repeatedly measured at each position (a total of 180 times) after one position was maintained for 10 min to allow vessel adaptation and recording. Ultrasonography was performed at the proximal part of the middle third of the clavicle for the right SCV and the level of the cricoid cartilage for the right IJV (Fig. 2).

A generalized estimating equation was used to evaluate the effect of LE. Central vein diameters in the supine position were repeatedly compared to those in 30° and 60° lower body elevation, to identify a position better than the supine position.

We evaluated normal spontaneous breathing subjects. The values for each of the six positions are shown in Table 1. The vertical diameters of the SCV and IJV were smaller when the upper body was elevated, but the central veins tended to decrease when the lower body was elevated (Fig. 3). The most suitable position for increasing the central vein diameters was LE.

The maximum diameter of the distended SCV in LE showed a slight statistically significant difference (coefficient −0.633, $p = 0.08$) and the maximum diameters of the distended IJV remained statistically significant (coefficients −0.863, $p < 0.001$) compared to that in the supine position, as shown in Table 2.

The SCV and IJV in LE were significantly distended compared to those in the supine position. Lowering the upper body without leg elevation could be considered a position for catheterization.

A similar study reported that leg elevation increased the diameter of the IJV more than that of the SCV [7], whereas interestingly, leg elevation for 10 min reduced the distended jugular veins to an extent. These results could be because the hemodynamic effects of leg elevation would reach their maximum within 1 min and diminish rapidly thereafter [8, 9].

The TP was determined to effectively dilate the central veins [10], but not applied in cases in which patients had contraindication or intolerance to the positioning or exhibited symptoms including dyspnea, vertigo, and pain [11]. Thus, these patients would require lower values of angle in the TP and more convenient position in which the height of pillow or blanket beneath their back was adjusted.

The Valsalva maneuver is one of the most effective maneuvers for central line placement [12-14]. The LE used in our study made minimal abdominal strength for raising the back even though the patients lost their consciousness. The LE might more increase the strain on the abdomen with higher lumbar position.

Our study has several limitations. First, we enrolled 30 normal subjects, which is a small sample size for a clinical investigation. Second, the pressure applied to the ultrasonography transducer was not standardized. Third, a degree of abdominal muscle tensing for LE is of questionable value.

Among the positions maintained by the subjects for 10 min, the most suitable position for increasing central vein diameter was LE. Cases in which the TP is not feasible, the central veins are fundamentally small, or patients are dehydrated, require the modified position such as LE. Therefore, the LE should be used during central venous catheter placement to decrease the risk of complications and failure.

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Table 2
Comparison of supine position with other positions in the diameters of central veins.

		Coefficient	Standard error	95% CI	p^*
SCV max	30°+	0	0.3297	(−0.646, 0.646)	1
	60°+	−0.177	0.3611	(−0.884, 0.531)	0.625
	LE (−15°)	−0.633	0.3615	(−1.342, −0.075)	0.08
SCV min	30°+	−0.213	0.303	(−0.807, 0.380)	0.481
	60°+	−0.286	0.3566	(−0.984, 0.413)	0.423
	LE (−15°)	−0.863	0.3414	(−1.533, −0.194)	0.011
IJV max	30°+	0.29	0.2708	(−0.241, 0.821)	0.284

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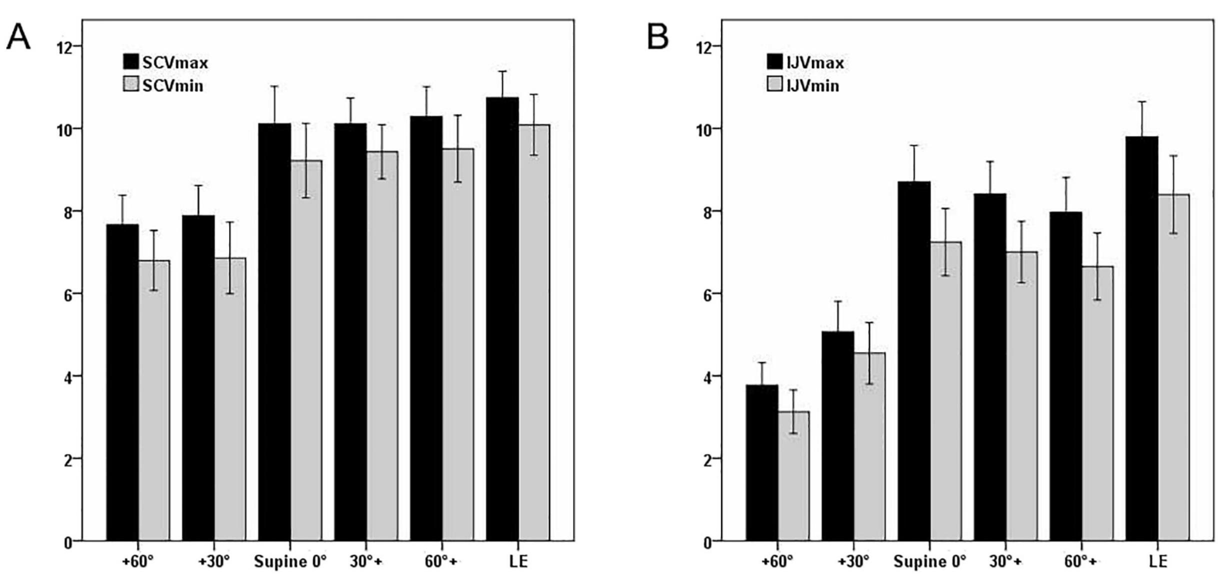

Fig. 3. Bar graphs show diameter changes.A, subclavian vein. B, internal jugular vein.

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1-hour bundle, an updated version of 3-hour bundle

To the Editor:

We read the interesting article by Shah et al. [1], who found that a sepsis screening tool implemented in an academic emergency department (ED) could increase the proportion of patients receiving timely antimicrobial therapy and demonstrated a trend towards decreased mortality. Though the study sounds scientific, we still have some concerns and different views after reading the article.

To begin with, Shah et al. claimed they designed the study for the sake of evaluating the sepsis screening tool implemented in their ED to determine its impact on the patients with sepsis. However, according to the flow chart of the study [1], only patients with severe sepsis and septic shock were included, those patients with sepsis were excluded, did the sepsis screening tool identify those patients with severe sepsis and septic shock more effectively than with sepsis or they just aim to target those patients with severe sepsis and septic shock? If so, it would be better to rephrase that their targeted population were patients with severe sepsis and septic shock rather than patients with sepsis in the title and context of the article and give reasons for doing so.

Besides, Shah et al. aimed to assess the efficacy of an ED sepsis screening tool, nevertheless, as a screening tool, the sensitivity, specificity, positive/negative predictive value, positive/negative likelihood ratio, the best cut-off, and receiver operating characteristic curve are fundamental for evaluating the accuracy, reliability and practicability of the screening tool. Therefore, we suggest the authors had better provide the readers with these characters of their screening tool.

Furthermore, the 3-hour bundle of 2012 version of Surviving Sepsis Campaign International Guideline was comprised of 4 vital elements — lactate measurement, obtaining blood cultures before administration of antibiotics, broad spectrum antibiotics administration, and application of 30 mL/kg crystalloid for hypotension or lactate ≧ 4 mmol/L [2]. According to Table 2 in the commented paper, after the screening tool had been modified and implemented, the compliance of the former three elements had been varied from 80.7% to 100%, while the compliance of the last one was just 41.9%, suggesting the main bottleneck of 3-hour bundle was adequate fluid resuscitation. In 2018, an updated version of bundles – 1-hour bundle – had been put forward by the task force of Surviving Sepsis Campaign as the result of new accumulated evidence. As per the new bundle [3], lactate measurement was still recommended and should be remeasured when the initial lactate value is >2 mmol/L and the other 3 vital elements were retained, in addition, a new element of applying vasopressors if patient is hypotensive during or after fluid resuscitation to maintain mean arterial pressure (MAP) ≧ 65 mm Hg was added to the old 3-hour bundle to form the new 5-element bundle, and the new bundle required all the 5 elements should be accomplished within 1 h due to sepsis was a medical emergency. Thus the future studies are required to evaluate the implementation of screening tools in EDs not only based on the new sepsis-3 definitions but also the new bundle of 1-hour bundle.

Abbreviations

ED	emergency department
MAP	mean arterial pressure

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