Supplementary Digital Content 7 **GRADE overview: Just-in-time simulation training for healthcare professionals**

| **Certainty assessment** | **№ of patients** | **Effect** | **Certainty** | **Importance** |
| --- | --- | --- | --- | --- |
| **№ of studies** | **Study design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** | **JIT** | **no JIT** | **Relative(95% CI)** | **Absolute(95% CI)** |
| **Total time (T1 and T2) (assessed with: seconds)** |
| 7 | randomised trials | seriousa | seriousb | not serious | very seriousc | none | 207 | 148 | - | SMD **0.38 SD lower**(0.96 lower to 0.2 higher) | ⨁◯◯◯Very low |  |
| **Product (T3) (assessed with: infection rate)** |
| 1 | observational studies | seriousd | not serious | seriouse | not serious | none | Before and after implementation of a central venous catheter (CVC) dress rehearsal program the overall cetnral line associated blood stream infection (CLABSI) rate decreased from 5.3/1000 CVC line days (January 2007 to October 2008) to 2.9/1000 line days (November 2008 to July 2010) (P < 0.001) | ⨁◯◯◯Very low |  |
| **Product (T2) (assessed with: Procedure success)** |
| 2 | observational studies | very seriousf | not serious | not serious | very seriousg | none | Kessler 2015 (infant LP): Crude RR 1.08 (95% CI 0.69-1.71) Absolute effect 28 more per 1,000 (from 109 fewer to 249 more) Nishisaki 2010 (intubation): Crude RR 0.80 (95% CI 0.52-1.24) Absolute effect 125 fewer per 1,000 (from 300 fewer to 150 more) | ⨁◯◯◯Very low |  |
| **Expert rated global performance (T2 Process)** |
| 5 | randomised trials | serioush | not serious | not serious | very seriousc | none | 131 | 106 | - | SMD **0.97 higher**(0.17 higher to 1.77 higher) | ⨁◯◯◯Very low |  |
| **Process (T1) (assessed with: various)** |
| 4 | randomised trials | very seriousi | not serious | seriousj | not serious | none | 236 | 237 | - | **0** (0 to 0 ) | ⨁◯◯◯Very low |  |
| **Knowledge** |
| 2 | observational studies | seriousd | not serious | very seriousk | not serious | none | After training participants of a JIT training session for intraosseous (IO) needle placement and defibrillator use had statistically significant increases in correct responses on 5 out of 5 procedure/equipment knowledge-related questions as compared to before training. (Itoh 2019) After training, participants of a JIT training session on nasopharyngeal swab collection had statistically significant increases in correct responses on 2 knowledge related questions. (Carlson 2021) | ⨁◯◯◯Very low |  |

**CI:** confidence interval; **SMD:** standardised mean difference

#### Explanations

a. Although studies showed consistent findings except for Branzetti 2017 , studies contributing more weight were moderate to high risk of bias overall

b. Studies had divergent results

c. The confidence interval crosses two decision making thresholds of small and moderate effect size

d. Non comparative before and after design

e. Only addressed 1 procedure (CVC dressing changes) which are not representative of all just-in-time simulation training tasks

f. Reported unadjusted proportions

g. Very wide confidence intervals, compatible with important benefit, no difference as well as important harm

h. Although studies showed consistent findings, studies contributing more weight were moderate risk of bias overall

i. Studies had moderate and high risk of bias

j. Many heterogeneous outcomes and studies

k. Only addressed knowledge for 2 types of procedures which are not representative of all just-in-time simulation training