Table 1

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| **Author, year** | **Design/**  **Country of Origin** | **Population/**  **Exposure** | **Participant Characteristics** | **Intervention / Control** | **Outcomes** |
| **Clinical studies** | |  |  |  |  |
| **Lee, 202314** | Prospective randomized controlled study / South Korea | OHCA | BLS and ALS hospital providers | Flow sensor real-time visual ventilation feedback device (Zoll Accuvent) / No feedback | Intervention = 63, control = 58  ROSC (55.5% vs. 36.2%, p=0.04)  30h survival (49.2% vs. 46.5, p=0.001).  Survival to discharge (4.9% vs. 8.6%, p=0.54)  Survival with good outcome (11.1 vs. 10.3, p=0.77)  No data on ventilation measures reported |
| **Drennan, 20247** | Prospective before-after study / Canada | OHCA | BLS and ALS EMS providers | Flow sensor real-time visual ventilation feedback device (Zoll Accuvent) / No feedback | Intervention = 221, Control = 191  ROSC (27% vs. 29%, p=NS)  Ventilation rate (12 (IQR 10, 17) vs. 14 (11, 19), p= 0.035)  Prop rate in target (53%±38 vs. 29%±9, p<0.001)  Insufflation volume measured (401ml (353, 472) vs. 374 (274, 453), p= 0.058)  Proportion volume in target (28%±17 vs. 21%±16, p<0.001)  Proportion volume & rate in target (19%±17 vs. 7%±10, p<0.001) |
| **Abella, 20071** | Prospective cohort study / USA | IHCA | BLS and ALS hospital providers | Real-time audiovisual feedback system using thoracic impedance / No feedback | Intervention = 101, Control = 45  ROSC (44.6% vs. 40.0%, p=0.58)  Survival to discharge (8.9% vs. 9.1%, p=0.97)  Ventilation rate (20+/-10 vs 18+/-8, p=0.12 for difference in mean and p=0.04 for difference in variance), |
| **Gerber, 20238** | Case series / USA | OHCA | EMS providers  ED hospital providers | Fow sensor real-time visual ventilation feedback device (Zoll Accuvent) / No control group  Comparison between EMS providers vs. hospital staff after ED admission | Total number of subjects = 3  Case 1: Rate 8/min vs. 17/min  Mean insufflation volume measured 500ml vs. 844ml  Case 2: Rate 6/min vs. 15/min  Mean insufflation volume measured 382ml vs. 610ml  Case 3: Rate 10/min vs. 14/min  Mean insufflation volume delivered 478ml vs. 638ml |
| **Lemoine, 202415** | Prospective cohort study / France | OHCA | BLS EMS providers | Flow sensor real-time visual ventilation feedback device (EOlifeX®) / no control group | N = 104  Mean insufflation volume measured: 538 [IQR 412–645] ml  Volume measured with passive exhalation: 291 [219–405] ml  Leakage: volume 199 [119–287] ml, ratio 41% [26%–54%]  intervention-time showed a slight improvement in leakage in ventilation 2 compared to one in 30:2 ratio |
| **McCarty, 201218** | Observational study, abstract only / USA | ED | ED hospital providers | CO2/Flow sensor real-time visual ventilation feedback device (NICO monitor, Philips) / no control group | N=11  Ventilation rates 17/min (IQR 11,20)  Insufflation volume measured 707 ml (IQR 564,827) |
| **Simulation studies** | |  |  |  |  |
| **Gould, 20209** | Simulation study / USA | Mannikin  Adult resuscitation scenarios | BLS and ALS EMS providers | Flow sensor real-time visual feedback device (Zoll AccuVent) / no feedback | N=20  Ventilations in target for:  Rate (71% vs. 41%, p<0.001)  Insufflation volume measured (79% vs. 31%, p<0.001),  Both (63% vs. 10%, p<0.001). |
| **Heo, 202010** | Simulation study / Korea | Mannikin  Adult and pediatric resuscitation scenarios | BLS (n=4) and ALS (n=22) hospital providers | Flow sensorreal-time visual feedbackdevice (Zoll AccuVent) / no feedback | N=26  Adult BV:  Insufflation volume measured: 432±64 vs. 393±136  Optimal insufflation volume measured: 47.3% vs. 18.5%  Optimal ventilation interval: 95.6% vs. 50.2%  Pediatric BV  Insufflation volume measured: 145±23 vs. 131±34  Optimal insufflation volume measured: 89.51% vs. 72.66%  Optimal ventilation interval: 95.83% vs. 57.14%  all p value<0.001 |
| **Khoury, 201912** | Simulation study / France | Mannikin  Adult resuscitation scenarios | BLS (n=20) and ALS (n=20) EMS providers | Flow sensor (EOlifeX®) visual ventilation feedback for manual ventilation / no feedback | N=40  ALS Group (ETT):  Ventilation rate: 10.7±1.1 vs. 16.2±6.9  Insufflation volume measured: 529±43 vs. 549±153  Inspiratory time: 1.3±0.5 vs. 1.2±1.5  I/E ratio: 0.3±0.1 vs. 0.5±0.2  Optimal ventilation volume (defined as insufflation volume between 300 to 600 ml and rate between 8-15 /min): 85% vs. 15%  BLS group (bag mask):  Ventilation rate: 10.8±1.1 vs. 18.2±8.0  Insufflation volume measured: 451±86 vs. 549±153  Inspiratory time: 1.3±0.5 vs. 1.2±1.5  I/E ratio: 0.3±0.3 vs. 0.6±0.2  Optimal ventilation: 90% vs. 15%  all p value<0.001 |
| **Kim, 202013** | Simulation study / Korea | Bench model | Senior hospital providers and EMT students | Flow sensor (Amflow®) real-time visual portable feedback device / no feedback | N=40  Insufflation volume measured: 505.6±32.2 vs. 534.2±73.5, p=0.012  Accurate volume range: 85.4% vs. 41%, p<0.001  Ventilation rate : 10 (IQR 10,10) vs. 9.4 (8.2, 12.2), p=0.62  Accurate rate : 99.2% vs. 12.5%, p<0.001 |
| **Lyngby, 202117** | Simulation study / Denmark | Mannikin  Adult resuscitation scenarios | BLS (n=27) and ALS (n=5) EMS providers | Pressure flow sensor (Zoll AccuVent) real-time visual feedback / no feedback | N=32  Ventilations in target for:  Rate 97% vs. 67%, p<0.001  Volume 77.5% vs. 53%, p<0.001  Both 75% vs. 22%, p<0.001 |
| **Charlton, 20214** | Simulation study / UK | Mannikin  Adult resuscitation scenarios | BLS (n=28) and ALS (n=78) EMS providers | Pressure flow sensor (Zoll AccuVent) real-time visual feedback system / no feedback | N=106  Insufflation volume within recommendation: 94.3% vs. 22.7%  Mean Insufflation volume: 546 (IQR 531-560) vs. 630 (518-725)  Ventilation within recommendation: 94.3% vs. 51%  Median Ventilation rate: 9 (IQR 9-9) vs. 10 (8-14) (McNemars test p=<0.0001). |
| **Scott, 202121** | Simulation study / USA | Mannikin  Adult resuscitation scenarios | ALS hospital providers | CO2/Flow sensor real-time visual ventilation feedback device (NICO, Philips) / no feedback | N= 52  Ventilatory rate: 10.7 (IQR 7.9-13.8) vs. 9.8 (8.0-13.5), p=0.79  Before feedback Insufflation volume measured appeared to be impacted among participant by sex, glove size. |
| **Wagner, 202223** | Simulation study / Austria | Mannikin  Pediatric resuscitation scenarios | ALS hospital providers | Pressure flow sensor (Neo Training) real-time visual feedback system / no feedback | N=40  Volume (ml/kg):  Inspiratory 10.15±4.6 vs. 12.83±6.0, p=0.002  Expiratory 6.81±2.6 vs. 7.34±3.5, p=0.174  Mask leak (%) 24.10±18.6 vs. 31.76±23.4, p=0.009  Dwell time on feedback devices was high, reducing attention to the infant's chest and mask. |
| **You, 201724** | Simulation study / South Korea | Mannikin  Adult resuscitation scenarios | BLS (n=10) and ALS (n=42) EMS and hospital providers | Flow sensor tidal volume monitoring device / no feedback | N=14  Optimal ventilation (%): 84.3±12.1 vs. 31.8±22.8, p<0.001  Ventilation interval (s): 6.1±0.1 vs. 6.1±0.1, p=0.29 |
| **Melia, 201219** | Simulation study, abstract only / USA | Mannikin  Adult resuscitation scenarios | EMS providers | Ventilation timer providing immediate feedback on respirations rate / no feedback | N=49  Ventilation rate: 11.77 (95% CI = 8.02–15.51) vs. 13.04 (95% CI = 9.29–16.78), p=0.016 |
| **Tran Dinh, 20236** | Simulation study, abstract only / France | Manikin  Adult resuscitation scenarios | Medical students trained at ALS level of care | Flow sensor (EOlifeX®) visual ventilation feedback / no feedback | N=344  Ventilation volumes (ml): 468 ± 90 vs. 625 ± 162, p < 0.0001)  Insufflation times (ms): 1478 ± 580 vs. 1180 ± 417, p < 0.0001 |
| **D'Agostino, 20245** | Simulation study, letter to editor / Italy | Mannikin  Adult resuscitation scenarios | ALS hospital providers | Flow sensor (EOlifeX®) visual ventilation feedback / instructor evaluation of ventilation quality | Correct ventilation assessment  Rate: 45% with feedback vs. 100% instructor, p<0.001  Volume: 5% with feedback vs. 100% instructor, p<0.001 |
| **Lemoine, 202416** | Simulation study, abstract only / France | Mannikin  Adult and pediatric resuscitation scenarios | BLS EMS provider | Blinded Flow sensor (EOlifeX®) visual ventilation feedback / no control group | Pediatric simulation (3 years – 14kg manikin)  Insufflation volume:  139ml  [IQR 89 - 193]  Volume exhaled:     117ml [IQR 78 - 163]  insufflation time: 758 [IQR 560–1019] ms  Exsufflation time: 326 [254–385] ms  Leakage ratio: 11% [4–19]  Prop in target volume: 13% [6–8 ml/kg] |

ROSC: Return of Spontaneous Circulation, IQR: Interquartile Range, BV: Bag valve, OHCA: out-of-hospital cardiac arrest, IHCA: in-hospital cardiac arrest, EMS: Emergency medical services, ALS: Advanced Life Support, BLS: Basic life support, EMT: Emergency Medical Technician, ED: Emergency Department