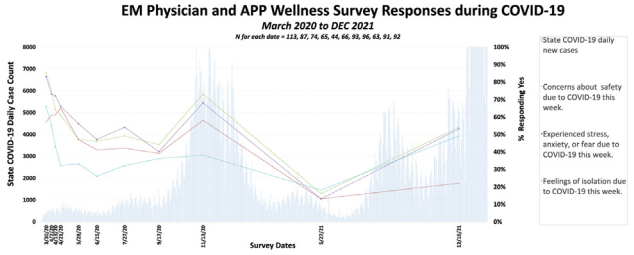
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

trends [Figure 1]. However, burnout increased over the 21-month period, ranging from 20 to 52% by December 2021 ($p<0.05$). Physicians and APPs were at significantly greater risk of burnout if they experienced an 'impact on their ability to care for children or dependents' (OR 3.32; 95% CI 2.15-5.15), 'strain on relationships' (OR 2.39; 95% CI 1.69-3.38), 'feelings of isolation' (OR 2.26: 95% CI 1.61-3.21), or 'symptoms of stress, anxiety, or fear' (OR 1.97; 95% CI 1.39-2.83). Mid-career physicians and APPs had greater odds of screening at risk on the WBI (burnout, severe fatigue, work-life integration) than their early-career peers (OR 1.27; 95% CI 1.15 - 1.4).

Conclusion: This 21-month longitudinal study adds to the literature by describing the prolonged wellness impact of the COVID pandemic on emergency physicians and APPs in the Midwest. Despite being resilient at baseline, the vast majority reported concerns for safety, stress, anxiety, fear, and isolation early in the pandemic and with subsequent surges. Mid-career physicians and APPs were identified as those most at-risk for burnout, which may be an important group to target wellness interventions. Burnout increased during the study period, implying that it is a culmination of insults over time. This data can be used to identify factors placing emergency physicians and APPs at greater risk for negative wellness outcomes and inform strategies to support our frontline team.



No, authors do not have interests to disclose

222 ED-ACT, Examining D-dimer and Empiric Anti-coagulation in COVID-19 Related Thrombosis

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Objective: Thrombosis is thought to occur frequently in the setting of acute SARS-CoV-2 infection. We aimed to elucidate the relationship between macro/micro vascular thrombosis, D-dimer levels, and empiric anticoagulation in acute COVID-19.

Methods: This was an exploratory prospective, single-site, observational study. Adult emergency department patients with COVID-19 requiring hospitalization received a point-of-care lower extremity ultrasound. Relevant clinical and demographic data were obtained by review of the electronic medical record. The primary endpoint was venous thromboembolism and associated D-dimer level. Secondary endpoints included rates of micro and macro thrombotic complications as well as empiric anticoagulant use.

Results: Between January 13th and April 12th 2021, 52 patients were enrolled. Median age was 55, 52% of patients were male. Median D-dimer at ED presentation was 650 ng/mL (range 250 to 10,000 ng/mL), among patients with negative duplex studies. One patient had a confirmed pulmonary embolism with a D-dimer of 5,082 ng/mL. During hospitalization, 18 patients underwent 20 studies assessing for VTE yielded one DVT event. Among patients with negative studies median D-dimer was 1,246 ng/mL (range 329-10,000 ng/mL). Two patients experienced microvascular complications. Seven patients were started on empiric full dose anticoagulation, with one non-severe bleeding event.

Conclusion: While VTE remains a major concern amongst patients with COVID-19, the normal D-dimer cut off of >500 ng/mL likely should not be used as a trigger to initiate further VTE workup. Additionally, mildly to moderately elevated D-dimer did not correlate strongly with microvascular complications and may not be relevant in the decision to initiate empiric full dose anticoagulation.

· Classic D-dimer cut offs are likely unreliable in acute COVID-19.

· Significantly elevated D-dimer in acute COVID-19 may be helpful in triggering a VTE workup.

· Without evidence of VTE, D-dimer alone should not be used to initiate empiric AC in COVID-19.

· Future research should focus on how best to utilize D-dimer for risk stratification in acute COVID-19.

No, authors do not have interests to disclose

223 A Multi-Modal Approach to Nerve Block Teaching

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Study Objectives: Ultrasound-guided regional anesthesia (UGRA) is quickly evolving into a pain treatment modality of choice due to its ability to provide effective analgesia without the use of opioids. While UGRA has become part of the training curriculum for most emergency medicine residents, comprehensive educational initiatives are still lacking. Our primary objective is to increase EP knowledge and confidence in performing ultrasound guided regional anesthesia (UGRA) by implementing a multi-modal nerve block teaching approach. Our approach includes a nerve block meat model workshop for both faculty and residents, posted QR codes containing procedural information, pre-assembled nerve block kits and bi-weekly nerve block posts on our educational platform. Our secondary objective is to increase the overall number of nerve blocks performed in the ED.

Methods: 11 residents participated in a nerve block workshop at a single academic teaching hospital. The workshop involved a lecture, landmark identification on models and hands-on practice on meat models which accurately simulated fascial hydrodissection under ultrasound. Knowledge and confidence were assessed on a survey pre- and immediately post-workshop. Surveys were repeated at 3 months post workshop to assess the number of nerve blocks performed in the ED.

Results: Prior to the nerve block workshop and our multi-modal approach, only 2 residents (16.7 % of the residents) had previously performed a fascia iliaca block and none of the residents had performed a serratus anterior block. Most of the residents responded "not confident at all" when asked about confidence level performing a fascia iliaca nerve block and a serratus anterior plane block. Three months after the nerve block workshop, all of the residents responded they were "moderately likely", "quite likely" or "extremely likely" to perform both of the blocks in the emergency department. Ninety percent of the residents reported feeling "moderately confident", "quite confident" or "extremely confident" performing the blocks in the emergency department. Sixty percent of the residents performed a fascia iliaca nerve block and 40% of the residents performed a serratus anterior plane block 3 months post workshop.

Conclusion: There are various barriers that exist in the adoption of UGRA by EPs in the ED. Our multi-modal approach attempts to address several different barriers at once in order to optimize the likelihood of UGRA use by EPs. We increased knowledge and confidence through a hands-on workshop that used realistic models which accurately simulated hydrodissection of fluid in a fascial plane. Frequent learning pearls emailed out to residents and attendings decreases knowledge attrition. Time to set-up for nerve blocks is decreased by the use of pre-assembled nerve block kits and QR codes posted on ultrasound machines contain quick access to procedural information. Training of both residents and attendings allows for the entire ED staff to be able to perform and supervise the same procedures. We designed our multi-modal nerve block teaching approach to allow for comprehensive education in and logistical support of UGRA for EPs which in turn increased confidence performing the nerve blocks in the ED. Our 3 month post workshop survey showed a significant increase in the total number of fascia iliaca nerve blocks and serratus anterior plane blocks performed in the ED.

No, authors do not have interests to disclose

224 Variable NIOSH Quantitative Fit Testing Failure Rates of Reused and Sterilized "Duckbill" Type N95 Masks

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Study Objectives: In response to worldwide shortages of N95 masks during the SARS-CoV2 pandemic, the Centers for Disease Control and Prevention (CDC) has highlighted various conservation and reuse strategies including isolation and vaporized hydrogen peroxide but with limitations of "safe" reuse of N95 masks up to five times. The aim of this project was to evaluate the results of NIOSH

quantitative fit testing after five trials of donning on a specific manufacturer's "duckbill" type N95 masks with/without repeated sterilization using vaporized hydrogen peroxide.

Methods: The cumulative effects of both repeated donning and doffing combined with repeated sterilization was evaluated using NIOSH Quantitative fit testing. Quantitative Fit testing generates an objective overall score across five separate tasks using an automated particle detection device to evaluate the integrity of both the mask materials and the seal on the participant. Two cohorts of duckbill type N95 masks were subjected to repeated cycles of 35% vaporized hydrogen peroxide (VHP) sterilization (five and ten cycles) and compared to one cohort of new unsterilized masks. All three cohorts were subjected to five trials of NIOSH quantitative fit testing following the protocol of donning the mask, NIOSH fit testing, then removal of the mask, with isolation for 24hrs. This cycle was repeated for five trials for each mask in each cohort. The fit testing trials were conducted on a single participant who has been fit tested and passed on this type and manufacturer's N95 mask. This repeated-measures design was chosen to remove the variability of facial size/shape for this study.

Results: Overall, a total of 150 fit testing trials were conducted, 5 trials on 30 total masks, with 10 masks in each cohort (New vs 5x sterilized vs 10x sterilized). There were a total of 21/150 (14%) fit testing trial failures, with 13/30 (43%) individual masks failing at least one fit testing trial and 4/30 (17%) masks that failed a variable number of fit testing trials spread across all five trials per mask. Chi-square analysis showed a significant increase in the percentages of masks that failed fit testing in both mask cohorts which underwent VHP compared to unsterilized/New masks (New $p=0.09$, 5x $p=0.03$, 10x $p=0.03$).

Conclusions: This data shows that this manufacturer's type and model "duckbill" N95 masks have a variable failure rate across repeated Quantitative NIOSH fit testing. There was an increased failure rate for masks that underwent sterilization. Our partner health system's mask recycling program thus discarded these type masks due to this variable failure rate. Health systems should thus consider individual testing to inform their overall policies on future mask reuse and/or recycling.

No, authors do not have interests to disclose

226 What Is the Effect of Training on the Performance of Different Video Laryngoscope Geometries Versus Direct Laryngoscopy to Achieve First Pass Success During Emergent Tracheal Intubation? A Systematic Review and Meta-Analysis

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Objective: We sought to perform a systematic review and meta-analysis of the effect of training on the performance of different video laryngoscope (VL) blade geometries to achieve first pass success (FPS) in the emergent setting in the emergency department, intensive care unit, or out-of-hospital setting.

Methods: We searched MEDLINE, Embase, and Web of Science (from database inception until April, 2022) to identify observational and randomized controlled trial (RCT) studies that compared FPS among the VL blade geometries and included data on operator level of training. We excluded studies for not comparing blade geometries, studies performed in the operating theater, simulation studies, duplicate studies, and those containing no extractable data. We used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology to assess the quality of included studies and used the Cochrane Risk of Bias Tool (RoB) to assess the risk of bias for the RCTs. Heterogeneity was assessed by the I2 statistic. Meta- analysis was performed using the Sidik and Jonkman random-effects model, and the results are reported as pooled odds ratios (OR) with 95% CI for FPS.

Results: We identified 1530 studies and excluded 1469; among the 61 included studies (75,583 total patients), 22 studies (36%) primarily had fellows or attendings in the intubating operators, 33 studies (54%) primarily had residents, and 6 (10%) primarily had out-of-hospital operators. Of the 61 studies, 10 (16.4%) were classified as having high quality evidence, 22 (36.1%) as moderate quality evidence, and 29 (47.5%) as low quality evidence using GRADE methodology. Among the 17 included RCTs, 8 (47.1%) were classified as having a low risk of bias using the RoB. In pairwise, random effects meta-analysis we found Macintosh-styled VL (MACVL) to be superior to DL for achieving FPS (OR = 1.66, 95% CI 1.36 -2.04, n = 27), as was hyperangulated VL (HAVL) (vs DL: OR = 1.82, 1.16 - 2.84, n = 27). MACVL and HAVL were comparable (OR = 0.94, 0.73 - 1.20, n = 4). For the studies with residents, MACVL was superior to DL (OR = 1.79, 1.40 - 2.28, n = 13). Similarly, for residents, HAVL was superior to DL (OR = 1.71, 1.21 - 2.42, n = 14). For the studies primarily with attendings, MACVL was comparable to DL (OR = 1.31, 0.96 - 1.77, n = 10); and for attendings, HAVL was also comparable to DL (OR = 2.34, 0.96 - 5.73, n = 11). For residents, HAVL was comparable to MACVL (OR = 0.94, 0.73 - 1.20, n = 4). There were no studies that directly compared HAVL to MACVL for attendings. Heterogeneity was moderate to high for all comparisons.

Conclusions: Resident physicians, but not attending physicians, intubating in the emergency department, intensive care unit, and out-of-hospital settings were more likely to achieve FPS using either a MACVL or HAVL device compared to a DL device. Although our results should be interpreted with caution, this meta- analysis suggests there is either a ceiling effect of VL devices to achieve FPS when performed by attendings or that residents may be more proficient with VL devices than attendings. Future studies should report the intubating operator's number of previous intubations to better quantify intubation experience as opposed to classifying experience based on attending or post-graduate year trainee status.

No, authors do not have interests to disclose

227 Canalith Repositioning Maneuvers (CRM) for Benign Paroxysmal Positional Vertigo (BPPV): A Synthesis of Systematic Reviews

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Study Objectives: Observing nystagmus during a provoking maneuver (like the Dix-Hallpike test) confirms the diagnosis of posterior canal BPPV in patients with a typical history and identifies the side and the specific canal affected. BPPV is treated effectively in most cases using Canalith Repositioning Maneuvers (CRM) like the Epley maneuver in the case of posterior canal BPPV.

Methods: This was a synthesis of systematic reviews, and we conducted a meta-analysis of individual study data. We followed guidelines for conduction of overview of systematic reviews and umbrella reviews. Patients: Adult patients diagnosed with posterior canal BPPV on Dix-Hallpike maneuver Intervention: Epley maneuver Comparison: placebo/sham procedure, or medications. Outcome: Resolution of vertigo symptoms, converting a positive to a negative Dix-Hallpike, falls and injuries, decreased side effects from unnecessary medications Harm: nausea/vomiting, inability to tolerate procedure A librarian performed the literature search after feedback from the content experts, methodologists, and patient representatives. Inclusion criteria were systematic reviews of posterior canal BPPV that performed a CRM, specifically the Epley maneuver, compared to sham maneuvers, placebo, medications, or control, as treatment for posterior canal BPPV.

Results: The literature search retrieved 2228 titles and abstracts that were screened in duplicate. Subsequently 70 titles were reviewed for full text review in duplicate, 7 systematic reviews were included in the qualitative synthesis and 1 systematic review was included in the quantitative synthesis. The outcomes of falls, injuries, and side effects from unnecessary medications were not measured or reported in any of the reviews. There was consistency observed across the 7 SRs. All reviews concluded that CRM are effective for the treatment of posterior canal BPPV. Treated patients were more likely to have resolution of symptoms at 7 and 30 days, and more likely to have negative Dix-Hallpike tests at follow up. We evaluated the effect of the intervention at 1 week and 1 month, and we found similar results with improvement of the symptoms among patients who received the Epley maneuver versus control. Specifically, resolution of symptoms at 1 week (251 patients, OR 5.32 [95% CI 2.95 to 9.59]) was in favor for performing Epley. Conversion from positive to a negative Dix-Hallpike test at 1 week (195 patients, OR 5.96 [95% CI 3.10 to 11.47]) also resulted in favor for performing Epley. There were no serious adverse effects of treatment. Rates of nausea during the repositioning maneuver varied from 16.7% to 32%.

Conclusion: There is significant improvement in symptoms among patients with BPPV that are treated at the bedside with canal repositioning maneuvers (Epley) without any serious side effects. Emergency physicians should treat their patients with Epley after clinical diagnosis of BPPV.