

## **UC Irvine**

### **Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health**

#### **Title**

Enhancing Toxicology Teaching with Escape Rooms

#### **Permalink**

<https://escholarship.org/uc/item/90r8x6fp>

#### **Journal**

Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health, 25(3.1)

#### **ISSN**

1936-900X

#### **Authors**

Jackson, Mason

Grass, Emily

Dimeo, Sara

#### **Publication Date**

2024-03-24

#### **DOI**

10.5811/westjem.20450

#### **Copyright Information**

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

**Table 1.**

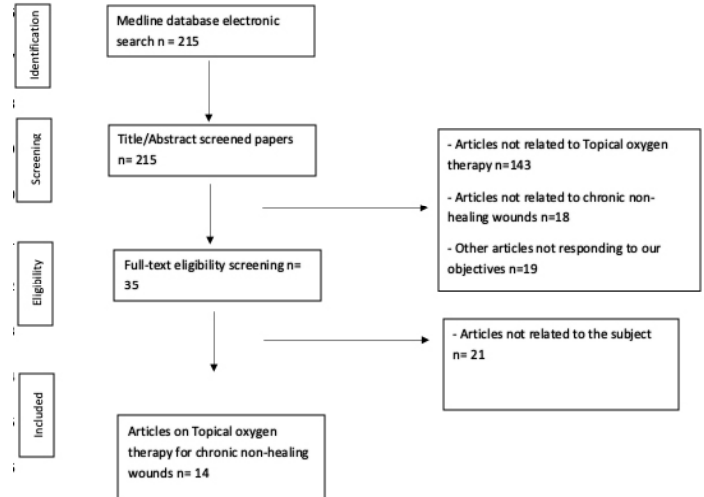
	Before		3 Months After		6 Months After	
	Control	Training	Control	Training	Control	Training
No. Charts	287	269	344	282	349	391
Female	152 (53.0)	156 (58.0)	188 (54.7)	152 (53.9)	196 (56.2)	201 (51.4)
Age < 18	40 (13.9)	40 (14.9)	38 (11.1)	25 (8.9)	46 (13.2)	62 (15.9)
Age 18-49	84 (29.3)	82 (30.5)	120 (34.9)	96 (34.0)	116 (33.2)	141 (36.2)
Age 50-65	58 (20.2)	61 (22.7)	71 (20.6)	72 (25.5)	71 (20.3)	72 (18.5)
Age >= 65	105 (36.6)	86 (32.0)	115 (33.4)	89 (31.6)	116 (33.2)	115 (29.5)
ESI 1	17 (5.9)	12 (5.5)	9 (2.6)	12 (4.3)	10 (2.9)	16 (4.1)
ESI 2	61 (21.3)	57 (21.2)	74 (21.5)	56 (19.9)	95 (27.2)	87 (22.3)
ESI 3	161 (56.1)	150 (55.8)	205 (59.6)	170 (60.3)	193 (55.3)	228 (58.3)
ESI 4 or 5	48 (16.7)	50 (18.6)	56 (16.3)	44 (15.6)	51 (14.6)	60 (15.4)

Data are presented as n (percentage of charts in the column).

**Table 2.**

	# charts	Median Total Words (IQR)	P-value for Main Fixed Effect Ignoring Effect of Resident	P-value for Main Fixed Effect Adjusting for the Random Effect of Resident (18 residents)
<b>Intervention</b>				
Training	673	1713 (1405, 2110)	<0.001	0.02
Control	693	1553 (1240, 1903)		
<b>PGY Level</b>			0.003	0.59
PGY 1	348	1577 (1239, 1975)		
PGY 2	459	1647 (1317, 2022)		
PGY 3	559	1643 (1299, 2049)		
<b>ESI Category</b>			<0.001	<0.001
ESI 1&2	359	1887 (1566, 2344)		
ESI 3	796	1619 (1330, 1972)		
ESI 4&5	211	1202 (1026, 1495)		
<b>Gender</b>			0.003	<0.001
Male	629	1563 (1238, 1939)		
Female	737	1680 (1343, 2088)		
<b>Age (years)</b>	1365	correlation r=0.52	<0.001	<0.001

topical oxygen is efficacious at increasing chronic wound healing rates and time, decreasing hospital stay rates and duration, and decreasing amputation and recurrence rates. Topical oxygen is less expensive than many treatments, fits virtually all patient lifestyles, and has even shown bactericidal/bacteriostatic properties.



**Figure 1. PRISMA flowchart for article selection process.**

## 63 Topical Oxygen Therapy in the Treatment of Non-Healing Chronic Wounds: A Systematic Review

Adam Pearl, Katherine O’Neil

**Background:** Chronic wounds are a significant economic and physical burden on both patients and the health care system. Although new therapies have shown efficacy, many have high costs, are not readily available, and are not feasible for most patients’ lifestyles. A promising emerging therapy is topical oxygen, which delivers concentrated oxygen directly to the non-healing wound.

**Methods:** A systematic review was conducted via PubMed between 1979 and July 2022, yielding 215 articles. After a full-text review, articles discussing other therapies for chronic wounds were excluded. Fourteen papers were included.

**Results:** In the treatment of non-healing diabetic foot ulcers, topical oxygen therapy demonstrated rates of complete closure of 80% for Stage II and 50% for Stage III, compared to 0% for standard of care. Additionally, flora transitioned from anaerobes to a flora rich in aerobic species. In non-diabetic foot ulcers, topical oxygen demonstrated increased rates of closure and decreased rates of infection, particularly noted in MRSA infections.

**Conclusion:** This systematic review demonstrates that

## 64 Enhancing Toxicology Teaching with Escape Rooms

Mason Jackson, Emily Grass, Sara Dimeo

**Background:** Gamification of medical education has proven to increase learned engagement and retention. Escape rooms, a gamification strategy, have been demonstrated to increase medical student clinical reasoning and information retention while increasing learner motivation. No published work exists regarding the application of gamification or its efficacy to toxicologic concepts.

**Objective:** To assess the efficacy of escape rooms in teaching basic toxicology concepts to medical students and residents. It is hypothesized that implementation of toxicology-based escape rooms will improve the learner’s understanding of the concepts presented.

**Methods:** Over a one-year period, third- and fourth-year medical students and PGY 1-3 emergency medicine residents from various allopathic and osteopathic programs participated in toxicology-based escape rooms which were followed by a short debriefing lecture. In this IRB approved study, three iterations of the escape room were presented. Participants were given a survey to assess their knowledge of concepts presented both before and after the escape room using a 1-5 Likert scale where 1 corresponded to “very poor”, 3 corresponded to “average” and 5 indicated “excellent”.

Repeat participants were excluded from analysis. Students t-test was employed to assess for significance.

**Results:** 51 participants were included in the analysis. The average pre-test score was between poor or average (2.83). After completing the escape room and debrief session, the post test score significantly increased to between average and above average (3.9) (p=0.0015). Anecdotal feedback indicated all ubiquitously enjoyed the escape room format as compared to traditional lecture across training levels.

**Conclusions:** Escape rooms can be formatted for various toxicology concepts for undergraduate and graduate medical education and can generate substantial shifts in perceived content mastery across various levels of training.

## 65 Emergency Medicine Resident Scheduling: A Survey of Processes and Satisfaction

*Jamaji Nwanaji-Enwerem, Tori Ehrhardt, Brittney Gordon, Hannah Meyer, Maurice Selby, Bradley Wallace, Matthew Gittinger, Jeffrey Siegelman*

**Background:** EM resident scheduling practices are important contributors to resident wellness while also placing time and financial demands on residency program leadership. Very little literature exists describing EM resident scheduling platforms.

**Objective:** We sought to summarize current EM residency scheduling practices.

**Methods:** We conducted a cross-sectional, convenience sample survey of EM residency programs in the summer of 2023 using Qualtrics. Subjects were recruited via two emails to the CORD listserv. Questions were piloted with program directors whose data were not included in analysis, with edits made for clarity based on feedback. We collected information on manual versus automated resident scheduling practices and resident and scheduler satisfaction. We examined relationships between resident and scheduler satisfaction using Spearman correlations. Relationships between satisfaction and scheduling software and characteristics were examined using Mann-Whitney U tests. Survey questions without answers were coded as “Unknown.”

**Results:** We received 19 survey responses, representing all geographic regions. Two programs (11%) reported scheduling manually. ShiftAdmin was the most popularly reported scheduling software (53%). Resident and scheduler satisfaction were modestly correlated (Spearman Rho = 0.38). Compared to the other software-based scheduling platforms and automated scheduling, manual scheduling had the lowest resident satisfaction score. Programs with <30 residents reported the highest levels of satisfaction. None of these relationships reached the threshold for statistical significance. Common dissatisfiers with software-based scheduling included cost, suboptimal automation algorithms, and steep

learning curves that new chief residents encounter annually.

**Conclusions:** Although satisfaction with manual scheduling was low, dissatisfiers with automated scheduling highlight a dire need for improvement in existing technologies.

**Table 1.** Relationships of schedule platforms and characteristics with resident and scheduler satisfaction.

	Resident Satisfaction mean (median)	P-Value	Scheduler Satisfaction mean (median)	P-Value
<b>Overall</b>				
Study Sample (n = 19)	3.2 (3)	-	3.4 (3)	-
<b>Scheduling Platform</b>				
Manual (n = 2)	2.5 (2.5)	reference	3 (3)	reference
MedFlow (n = 2)	3.5 (3.5)	0.87	3 (3)	0.99
MetricAid (n = 1)	4 (4)	0.99	4 (4)	0.99
Qpedia (n = 3)	3 (3)	0.99	2.3 (3)	0.99
ShiftAdmin (n = 10)	3.3 (3)	0.73	3.7 (3.5)	0.82
Qpedia/ShiftAdmin (n = 1)	4 (4)	0.99	4 (4)	0.99
<b>Scheduling Format</b>				
Manual (n = 2)	2.5 (2.5)	reference	3 (3)	reference
Automated (n = 7)	3.3 (3)	0.76	3.4 (3)	0.99
Combination (n = 9)	3.2 (3)	0.71	3.2 (3)	0.99
Unknown (n = 1)	5 (5)	0.87	5 (5)	0.99
<b>Scheduling Practice Length</b>				
< 2 years (n = 4)	2.8 (3)	reference	2.8 (3)	reference
2 – 4 years (n = 7)	3.7 (4)	0.28	3.3 (3)	0.83
4 – 6 years (n = 3)	3.3 (4)	0.58	3.3 (3)	0.89
> 6 years (n = 5)	3 (3)	0.79	4 (4)	0.20
<b>Number of Residents</b>				
≤ 30 (n = 4)	4 (4)	reference	3.75 (3.5)	reference
> 30 (n = 10)	3.4 (3.5)	0.25	3.2 (3)	0.50
Unknown (n = 5)	2.4 (2)	-	3.4 (3)	-

P-Values from Mann-Whitney U tests with manual scheduling, scheduling practice length < 2 years, and programs with ≤ 30 residents as the references.

## 66 Use of Preferred Learning Styles in an Emergency Medicine Residency Academic Remediation Program

*Anthony Sielicki, Dylan Krause, Jessica Parsons Claire Abramoff, Deborah Pierce*

**Background:** Many trainees encounter difficulties with the acquisition of fundamental knowledge or skills necessary to practice independently. The ACGME requires remediation plans that are tailored to the individual needs of the struggling learner. Few resources are given to help generate these required tailored plans.

**Objectives:** We aimed to examine the effectiveness of Kolb Preferred Learning Styles in the development of learning plans for EM residents on academic remediation. We predicted that it would be more effective in preparing residents for success on the In-Training Exam (ITE) compared to education-as-usual.

**Methods:** This is a prospective study at an academic, urban hospital. Residents who scored less than the 30th percentile on the ITE were placed on academic remediation. All took the Kolb Learning Styles Inventory V. 3.1 to discover their preferred learning style. A learning contract was generated using activities that fit with their style. Their ITE scores in the following year were compared to their initial ITE score.

**Results:** 14 residents in the 2020-2021 academic years