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ACCREDITED EDUCATION INSTITUTES
ENHANCING PATIENT SAFETY THROUGH SIMULATION

2019 ACS Surgical Simulation Summit

AN INTERNATIONAL MULTI-PROFESSIONAL MEETING

MARCH 15-16, 2019 | Swissôtel, Chicago, IL

Pre-Meeting Activities: Thursday, MARCH 14, 2019

facs.org/aeisummit



100+years

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*Inspiring Quality:
Highest Standards, Better Outcomes*

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Blended Surgical Education and Training for Life®



Knot Tying Struggles for Surgical Interns: *Bare Hands vs. Gloves vs. Gloves with Butter*

N. Shaikh, V. Yeh, F. Mukhtar, A. Chandra, C. Backstrom, R.U. Azevedo, M. Baloul, A. Rajesh, D. Farley

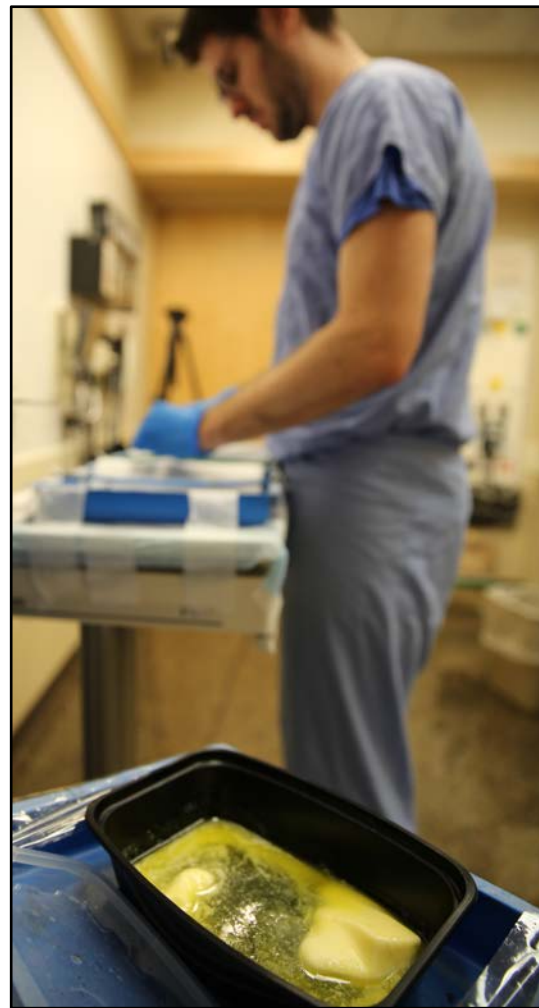
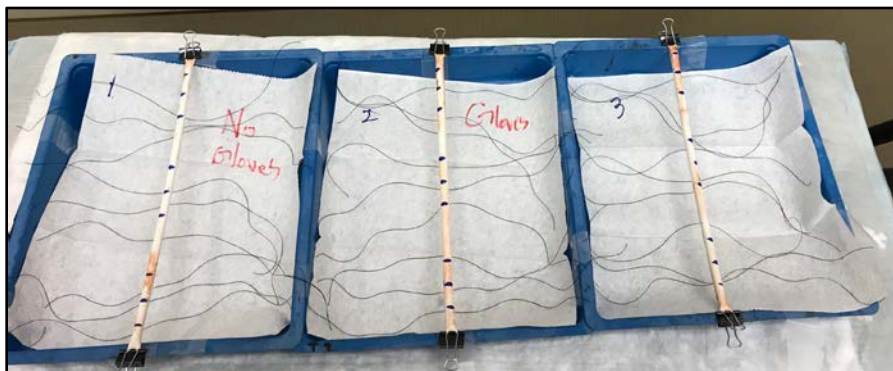
Funding Source for My Research Project

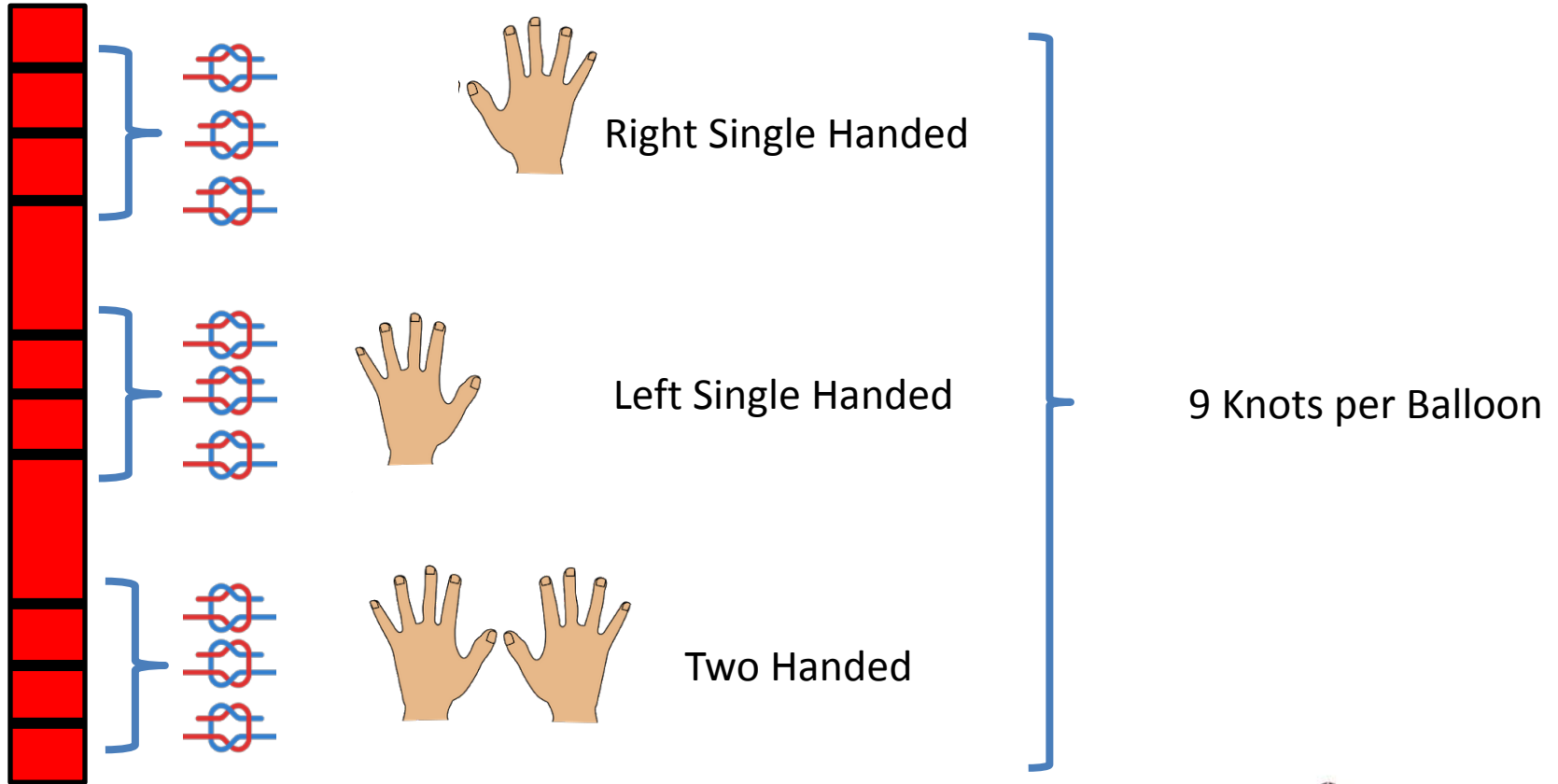
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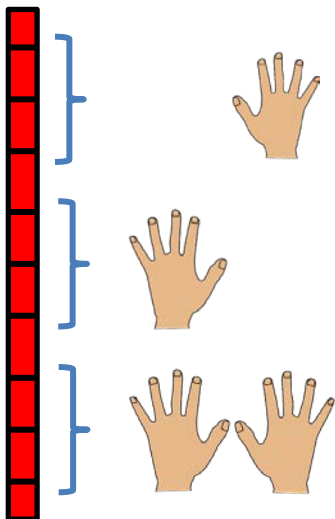
	Potential Funding Sources	Check all that apply
1	Sim center operational funds	<input checked="" type="checkbox"/>
2	Intramural grant	<input type="checkbox"/>
3	Clinical Departmental funds	<input checked="" type="checkbox"/>
4	Hospital operations	<input type="checkbox"/>
5	School of Medicine	<input type="checkbox"/>
6	Hospital QI/PI Process	<input type="checkbox"/>
7	Philanthropy	<input checked="" type="checkbox"/>
8	Insurance Company	<input type="checkbox"/>
9	Industry	<input type="checkbox"/>
10	NIH/AHRQ or other governmental funding source	<input type="checkbox"/>
11	DoD	<input type="checkbox"/>
12	Not for Profit or Professional Society	<input type="checkbox"/>
Other		<input type="checkbox"/>

Assess open knot-tying proficiency

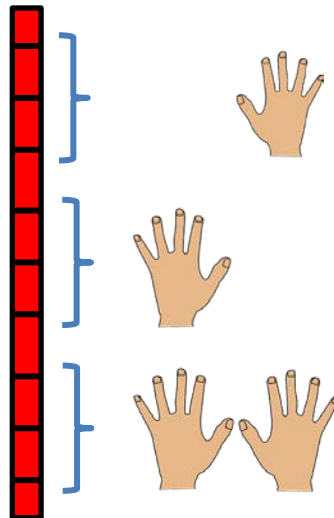




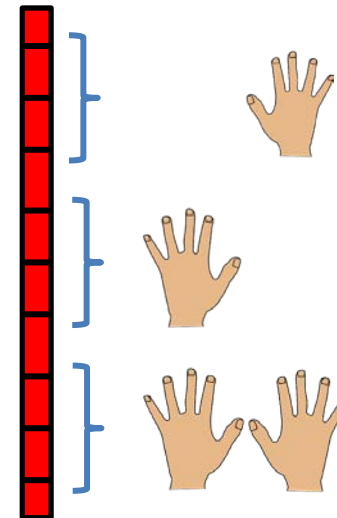
Station 1

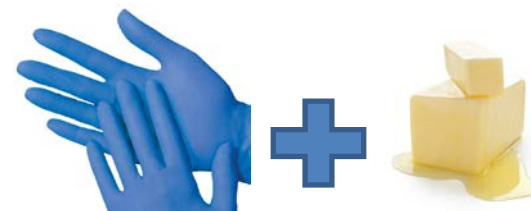
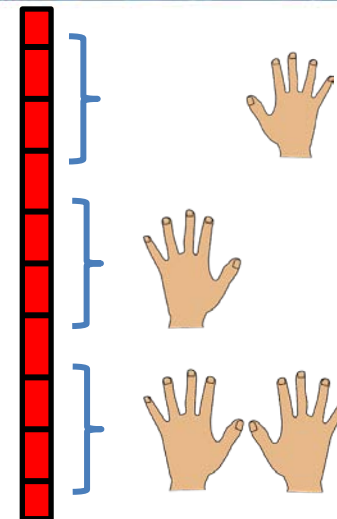
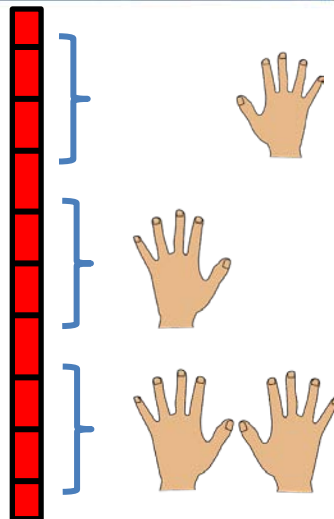
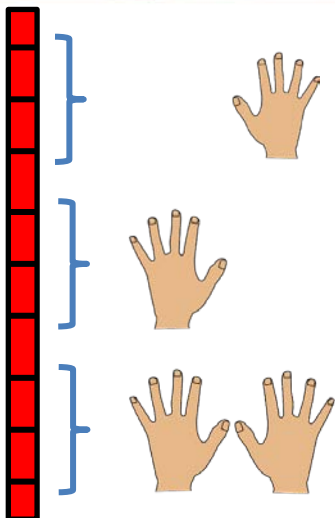


Station 2



Station 3





27 Knots per Participant



Time



Drop



Square
Knot



Accuracy



Leakage



Post- Q's



21 Interns = 566 Knots

Bare Hands
(n = 189)

Plain Gloves
(n = 189)

Gloves + Butter
(n = 188)



Proficiency of Knot-Tying in each Station

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	Station 1 Bare-Handed	Station 2 Plain Gloves	Station 3 Butter-Coated Gloves	p-value
Number of Knots	189	189	188	
Mean Time (sec)	16	17	17	0.24
Leaked	137 (72%)	137 (72%)	136 (72%)	0.99
Accurate	107 (57%)	122 (65%)	115 (61%)	0.29
Square Knot	180 (95%)	176 (93%)	176 (94%)	0.65
Mean number of Drops	0.5	0.5	0.5	0.64

Note. Accurate = 0mm from mark on the balloon, SD = Standard deviation.

Post-Participation Questionnaire

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46%



15%



31%



8%

13 Responses



62%

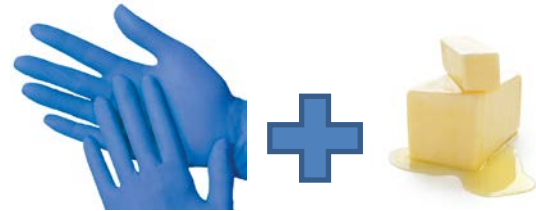


70%

Knot Tying Proficiency vs. Mental Focus

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Knot Tying Proficiency VS Mental Focus

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	Accuracy (2)	Accuracy&Time (1)	Time (6)	Leakage (4)	<i>p-value</i> **
Mean Time (sec)					
Leaked					
Accurate					
Square Knot					
Mean number of Drops					

Note. Accurate = 0mm from mark on the balloon; SD = Standard deviation; * = Statistically significant;
** = *p-value* comparing mental focus on leak vs. focus on other aspects combined

Knot Tying Proficiency VS Mental Focus

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	Accuracy (2)	Accuracy&Time (1)	Time (6)	Leakage (4)	<i>p-value</i>
Mean Time (sec)	18	23	19	16	0.0037
Leaked	43 (80%)	13 (48%)	107 (66%)	32 (30%)	< 0.0001
Accurate	41 (76%)	12 (44%)	104 (64%)	89 (82%)	0.0007
Square Knot	52 (96%)	22 (81%)	157 (97%)	108 (100%)	0.005
Mean number of Drops	0.7	0.7	0.5	0.2	< 0.0001

Mental focus: Leak vs. Other aspects

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Bare-Handed	Other (81)	Leak (36)	<i>p-value</i>
Mean Time (sec)	18	16	0.37
Leaked	54 (67%)	11 (31%)	0.0005
Accurate	50 (62%)	28 (78%)	0.14
Square Knot	80 (99%)	36 (100%)	0.99
Mean number of Drops	0.5	0.2	0.04

Mental focus: Leak vs. Other aspects

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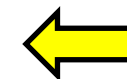
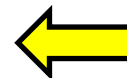
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Plain Gloves	Other (81)	Leak (36)	<i>p-value</i>
Mean Time (sec)	20	17	0.23
Leaked	53 (65%)	12 (33%)	0.002
Accurate	58 (72%)	30 (83%)	0.25
Square Knot	77 (95%)	36 (100%)	0.31
Mean number of Drops	0.6 [0.9]	0.2	0.02



Mental focus: Leak vs. Other aspects

Butter-Coated Gloves	Other (81)	Leak (36)	<i>p-value</i>
Mean Time (sec)	20	15	0.0008
Leaked	56 (69%)	9 (25%)	< 0.0001
Accurate	49 (60%)	31 (86%)	< 0.0056
Square Knot	74 (91%)	36 (100%)	0.10
Mean number of Drops	0.6	0.1	0.0001



- Small # of participants
- Knots were not satisfactory at baseline
- Limited number of survey respondents
- Two separate weeks
- Surgical gloves were not used
- Biannual assessments focus on speed

- No difference in knot-tying proficiency
- Simulated the true OR conditions
- Prioritize focus on leak

- Follow skill progression through residency
- Compare focus: resident vs staff
- Repeat study with senior residents