



**2011 ABSA
Platform Presentations**

Effects of Science and Safety Training on Biosafety Program and Readiness Risk Perception

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ABSA Platform Presentation: Anaheim, California

Effects of Science and Safety Training on Biosafety Program Readiness Risk Perception

History of Training Program

☣ Born out of the SERCEB Science and Safety BSL3 and BSL4 training Program

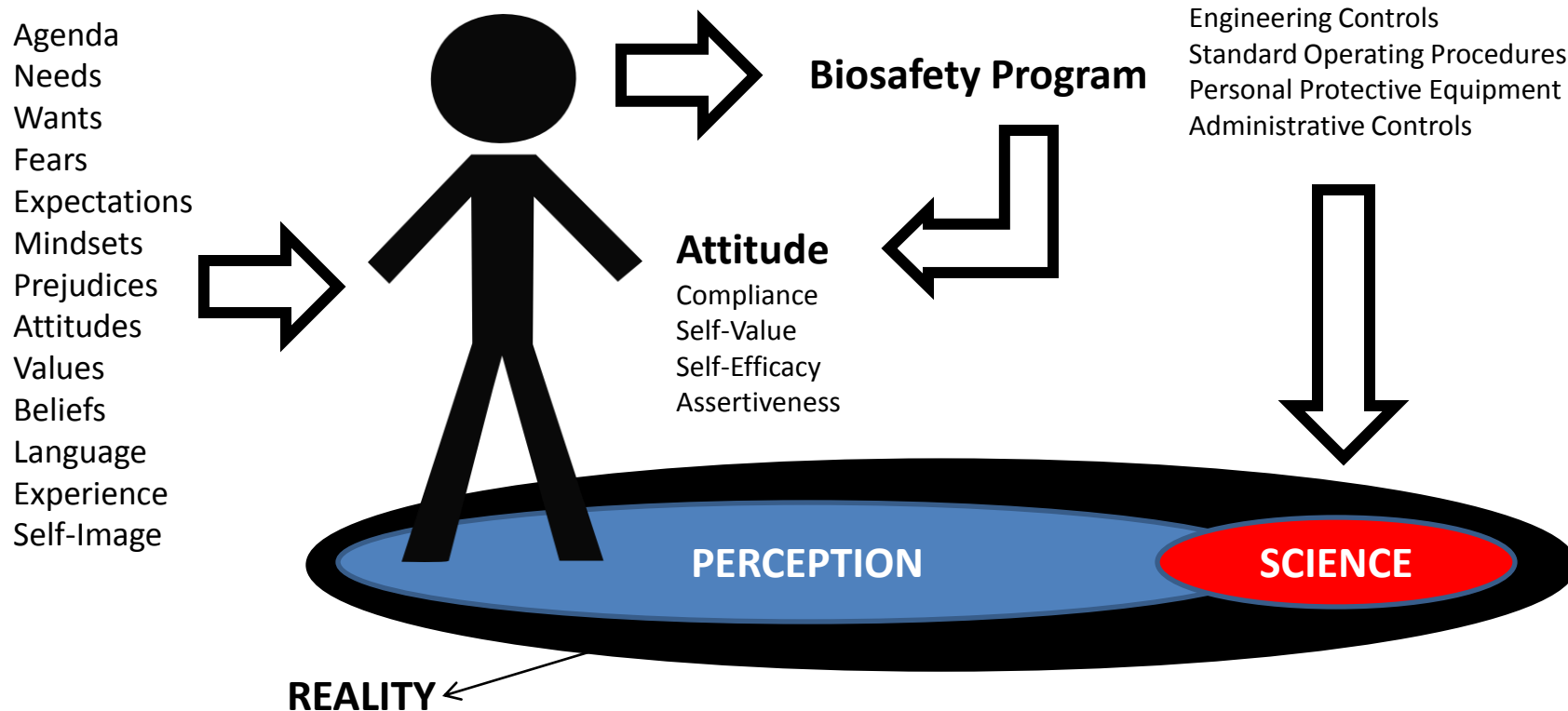
☣ Behavioral-Based Biosafety Training Program

- 40% Lectures
- 40% Laboratory
- 10% Group Sessions
- 10% Administration/Evaluation

☣ Similar model used since 2004



Perception and Behavior



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Four Primary Controls of Biosafety

Four Primary Controls of Biosafety			
Engineering	Personal Protective Equipment	Standard Operating Procedures	Administrative
Directional Airflow	Gloves	Donning/Doffing PPE	Training
Biosafety Cabinets	Eye Protection	Transporting Pathogens	SOP Compliance
Interlocked Doors	Respirators (N95, PAPR)	Handling Needle Sticks	SOP Evaluation/Validation
Hands Free Sinks	Tyvek Suit	Cleaning a Spill	Medical Surveillance
Self Closing Doors	Laboratory Scrubs/Shoes	Laboratory Decontamination	Incident Surveillance
HEPA Filters	Booties	Emergency Evacuation	Background Checks

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Readiness and Sustained Behavior

- ④ Understanding of risk in BSL(?) laboratory.
- ④ Understanding of benefit for all BSL(?) laboratory SOPS.
- ④ Access to resources needed to do work safely.
- ④ Skills to work safety in BSL(?).
- ④ Readiness to work in BSL(?) safely.



Grading Scale

⚠ **A = Excellent**

⚠ **B = Good**

⚠ **C = Fair**

⚠ **D = Poor**

⚠ **F = Unacceptable**

⚠ Engineering

⚠ PPE

⚠ SOPs

⚠ Administrative

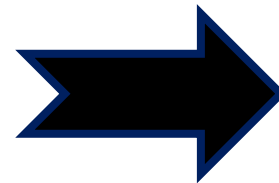
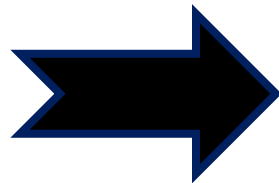
⚠ Risk

⚠ Benefit

⚠ Resources

⚠ Skills

⚠ Self-Efficacy



Grading Methodology

☣ **A = 4**

If there were 5 As, 2 Bs, 1 C, 1 D and 1 F the following equation would occur:

☣ **B = 3**

$$(4 \times 5) + (2 \times 3) + (2 \times 1) + (1 \times 1) + (1 \times 0) = 29/10 = 2.9 \text{ (B)}$$

☣ **C = 2**

☣ **D = 1**

☣ **F = 0**

<u>Grade</u>	<u>Point Values</u>	<u>Range</u>
A	4.00	3.790-4.000
A-	3.68	3.500-3.689
B+	3.38	3.380-3.499
B	3.00	2.690-3.379
B-	2.68	2.500-2.689
C+	2.38	2.380-2.499
C	2.00	1.690-2.379
C-	1.68	1.500-1.689
D+	1.38	1.380-1.499
D	1.00	1.000-1.379
D-	0.67	0.667-0.999
F	0	0.000-0.666

Results - Demographics

☣ Evaluated 9 Courses

- 1 BSL2 – 11%
- 6 BSL3 – 67%
- 2 BSL4 – 22%

☣ Looked at 139 Respondents

- BSL2 (N=23) – 17%
- BSL3 (N=89) – 64%
- BSL4 (N=27) – 19%

☣ Location

- Domestic – 6 (4 BSL3, 2 BSL4)
- International – 3 (1 BSL2, 2 BSL3)



Results – By Primary Control

Engineering	BSL2	BSL3	BSL4	PPE	BSL2	BSL3	BSL4
Pre	2.6 (B-)	3.14 (B)	2.4 (C+)	Pre	2.8 (B)	3.16(B)	3.3 (B)
Post	2.6 (B-)	3.8 (A)	3.2 (B)	Post	3.0 (B)	3.34 (B)	3.8 (A)
Difference	-	.66 (16%) ↑	.8 (20%) ↑	Difference	.2 (5%) ↑	.18 (4%) ↑	.45 (11%) ↑

SOPs	BSL2	BSL3	BSL4	Admin	BSL2	BSL3	BSL4
Pre	2.7 (B)	2.74 (B)	2.9 (B)	Pre	2.3 (C)	2.6 (B-)	3.0 (B)
Post	2.8 (B)	3.5 (A-)	3.2 (B)	Post	2.8 (B)	3.3 (A-)	3.5 (A-)
Difference	.1 (2%) ↑	.76 (19%) ↑	.3 (7%) ↑	Difference	.5 (12%) ↑	.77 (19%) ↑	.45 (11%) ↑

N=23
↑ 10%

N=89
↑ 14%

N=27
↑ 12%

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Results – By Sustained Behavior

Understand	BSL2	BSL3	BSL4	Benefit	BSL2	BSL3	BSL4
Pre	2.0 (C)	2.5 (B-)	2.8 (B)	Pre	2.1 (C)	2.4 (C+)	2.8 (B)
Post	3.4 (B+)	3.7 (A)	3.8 (A)	Post	3.4 (B+)	3.7 (A)	3.6 (A)
Difference	1.4 (35%) ↑	1.2 (30%) ↑	1.0 (25%) ↑	Difference	1.3 (32%) ↑	1.3 (32%) ↑	.8 (20%) ↑

Resources	BSL2	BSL3	BSL4
Pre	2.3 (C)	2.4 (C+)	3.0 (B)
Post	3.2 (B)	3.6 (A-)	3.5 (A-)
Difference	.9 (22%) ↑	1.2 (30%) ↑	.5 (12%) ↑

N=23
 ↑ 26%

N=89
 ↑ 32%

N=27
 ↑ 20%

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Results – By Sustained Behavior (continued)

Skills	BSL2	BSL3	BSL4	Readiness	BSL2	BSL3	BSL4
Pre	2.1 (C)	2.0 (C)	2.3 (C)	Pre	2.5 (B-)	2.0 (C)	2.3 (C)
Post	3.2 (B)	3.4 (B+)	3.3 (B+)	Post	3.2 (B)	3.4 (B+)	3.2 (B+)
Difference	1.1 (27%) ↑	1.4 (35%) ↑	1.0 (25%) ↑	Difference	.7 (17%) ↑	1.4 (35%) ↑	.9 (22%) ↑

N=23
 ↑ 26%

N=89
 ↑ 32%

N=27
 ↑ 20%

Conclusions

- ④ All individuals trained were scheduled to work in or support the assigned laboratory.

- ④ Program led to:
 1. Increased perception of value in all four primary controls.
 2. Increased perception of personal readiness and understanding of risks and benefits (SOPs).
 3. Increased perception of having resources and skills needed to work safely.
 4. Program discovered all staff could self-reportedly benefit from safety training.



Limitations

- ⚠ Small sample size for BSL2/BSL4
- ⚠ Model or safety training in general?
- ⚠ Lack of data understanding (why and what)
- ⚠ Instructor differences/performance
- ⚠ No comparison group – so what do results mean?
- ⚠ Is increased perception of value and readiness a good thing?



Recommendations

- ④ Continue collecting data and looking at results
- ④ Continue training
- ④ Partner with other training programs
- ④ Develop follow-up survey
- ④ Write-up and discuss results





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Thank you!

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