



# Human Factors Research and Ground Ambulance Design

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May 10<sup>th</sup>, 2016

# Disclosures

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Nothing to disclose

# Principal Partners

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# Project Objectives

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1. Collaborate with multiple stakeholders to improve ambulance design.
2. Engage AHS EMS personnel in participatory design.
3. Translate research results into ambulance design guidelines.
4. Build a better ambulance to improve patient care and provider safety.

# Alberta and AHS

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# Methods

# Equipment

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Demers MX-164 (2800 Series)



w21c.org

ASL MobileEye



 W21C

Drift Cam (1080p)





# Human Factors Evaluation of AHS EMS Ambulance Design







# Results

# Data Analysis



# Data Analysis

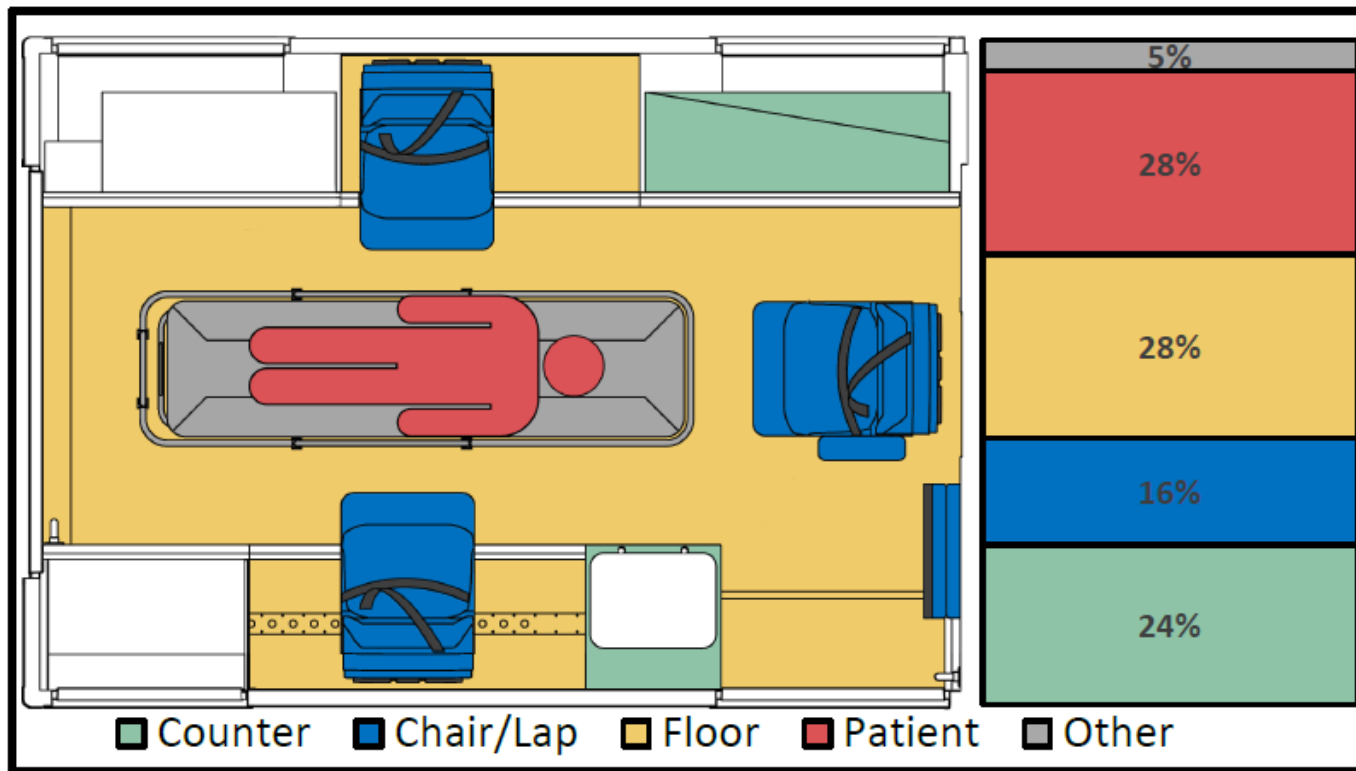
- Sub\_9
- Sub\_11
- Sub\_13
- Sub\_15
- Sub\_17
- Sub\_19
- Sub\_21
- Sub\_23
- Sub\_25
- Sub\_27
- Sub\_29
- Sub\_31
- Sub\_33
- Sub\_35
- Sub\_37
- Sub\_39
- Sub\_41
- Sub\_43
- Sub\_45
- Sub\_47
- Sub\_2
- Sub\_4
- Event Files (1)
- Video Files (4)
  - Sub\_4\_PS\_1
  - Sub\_4\_PS\_2
  - Sub\_4\_PS\_3
  - Sub\_4\_PS\_4
- Audio Files ...
- External Data F...
- Plug-ins (0)
- Sub\_6
- Sub\_8
- Sub\_10
- Sub\_12
- Sub\_16
- Sub\_18
- Sub\_20
- Sub\_22
- Sub\_24
- Sub\_26
- Sub\_28
- Sub\_30



Time	Subject	Behavior	Modifier	Comment
1305.78	Primary	Standing 3 POC gra		
1308.61	Primary	Standing, 3> POC		
1308.81	Primary	Hurdle over	Mild	
1309.52	Primary	Standing 3 POC gra		
1310.15	Primary	CPR		
1315.42	Primary	Hurdle over	Severe	
1315.59	Second	Airway		
1315.85	Primary	Primary		
1316.32	Primary	Standing, 3> POC		

Standing 3 P...		aa	
Standing 3 P...		ii	
Standing, 3>...		t	
Sitting seat b...		it	
Sitting no se...	Tertiary	in	
Kneeling		an	
Stuffed on Pa...			
Airway Suppl...		Ar	aR
Medicine Su...		Me	mE
Bag from eq...		Bv	bV
Misc. (Dange...		Ms	mS
Resting on p...		se	SE
Hazardous ...			
HCP - Object		HC	
HCP - HCP		HP	
HCP - Patient		Ha	
Patient - Obj...		Pa	
Fall		Fa	
Lose balance		Lo	
Tangle		Ta	
Hurdle		Hu	
Position			
Outside		Ou	
CPR		CP	
Airway	Primary	Ai	
Primary	Second...	Pr	
This participa...	Tertiary	N6	
Scenario ru...			
Scenario time	Primary...	No	
Lifepack Ch...			
Lifepack not ...	Primary...	Li	
Chords in way		Ch	
Behavior1		Bh	
Events of In...			
Something N...		Ev	
Workspace			
Correct	Primary...	Cr	cR
Patient		Pt	pT
Lap	Primary	La	lA
Chair		Ca	cA
Stretcher		rt	rT

# Workspace Use





# Informing Design

# Interpreting Self-Report Data

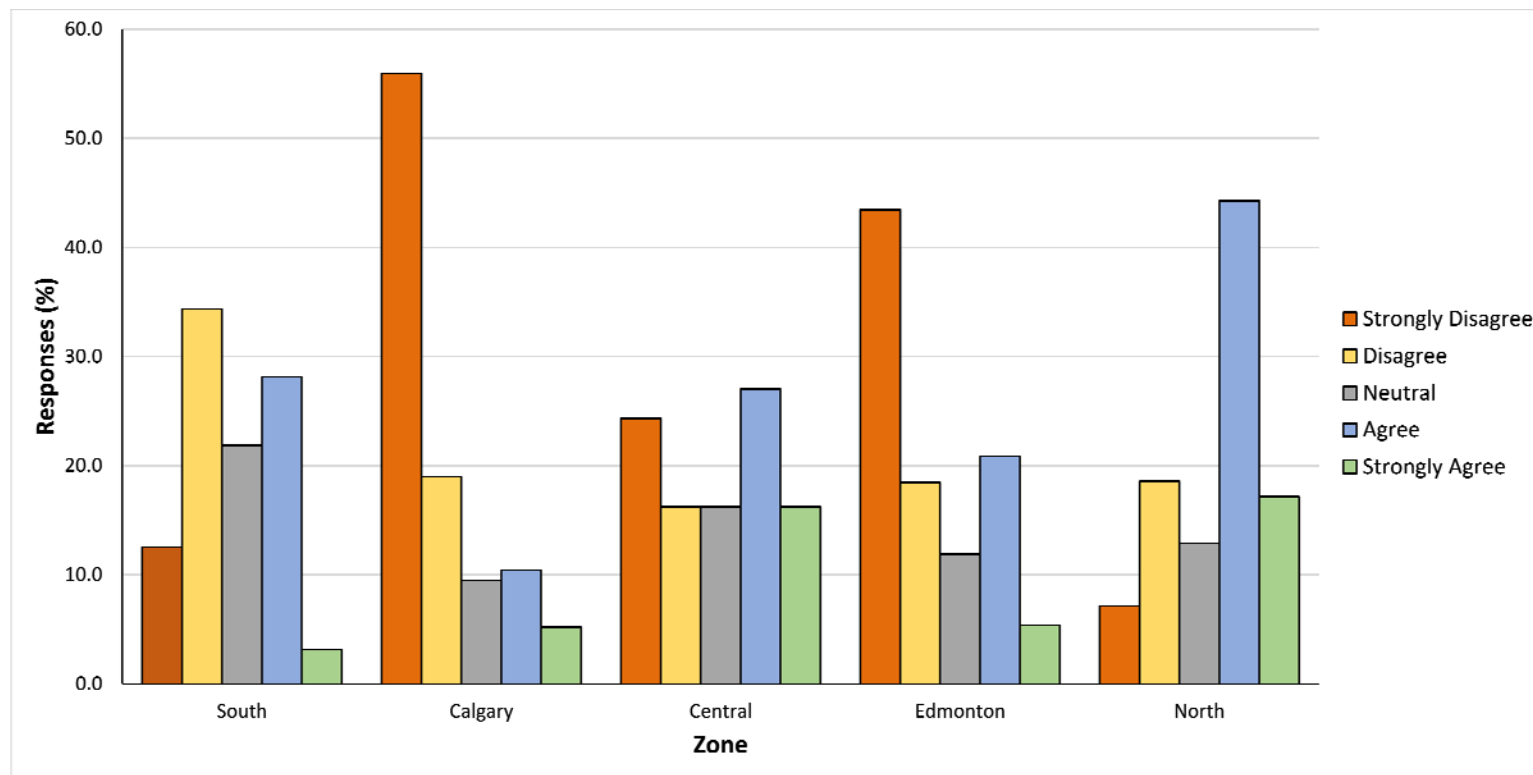


Figure. Responses to “I Prefer the new ambulance design to previous designs” by zone of operation.

# Interpreting Self-Report Data

Strength	Rating
Light package	11.2
Seating	8.0
IV drawer	7.7
Enough Room	7.3
Better ride	6.2
Workspace	2.8

Weakness	Rating
Lack of Room	19.6
No Bench	10.5
Seating	8.4
Worse Ride	6.9
Workspace	6.8
Stretcher	1.4

# Recommendations for Design

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- › Physical Dimensions
- › Seating
- › Equipment Access and Workspace
- › Cabling and Tubing
- › Waste Disposal
- › Provider Suggestions



# Challenges

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- › Interaction of design features
- › Design for actual use or intended use
- › Standardization for a diverse population

# Acknowledgements

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- › **Jeff Caird**, Ph.D., Professor, Psychology, U. of Calgary;
- › **Greg Hallihan**, M.Sc., Research Associate, W21C, U. of Calgary;
- › **Kate Johnston**, M.Sc. Student, Department of Psychology, University of Calgary;
- › **Matthew Wilkins**, B.Sc. Honours Student, Department of Psychology, University of Calgary;
- › **Katelyn Wiley**, B.A. Student, Department of Psychology, University of Calgary;
- › **Nancy Clayden**, Research Associate, W21C, University of Calgary;
  
- › **Ian Blanchard**, M.Sc., EMT-P, Senior Performance Strategist, EMS, AHS;
- › **Mike Plato**, BClinicalPrac, EMT-P, Provincial Director, Fleet, EMS, AHS;
- › **George Gauvreau**, EMT-P, Provincial Fleet Manager, EM, AHS;
- › **Brent Thorkelson**, Senior Staff Development Officer, Learning and Development, EMS, AHS;
- › **Ian McEwan**, Staff Development Officer, Learning and Development, EMS, AHS;
  
- › **John Gelinas**, EMT-P, Manager, Learning and Development, EMS, AHS;
- › **Dr. Gerald Lazarenko**, BSc. Pharm, M.D., FRCPC, Medical Director, EMS, AHS;
- › **Tom O'Neal**, Ph.D., Assistant Professor, I/O Psychology, University of Calgary;
- › **Nermin Helal**, Ergonomist, Vancouver Coastal Health;
- › **Jason LaBerge**, M.Sc., Human Factors Manager, Patient Safety Division, AHS;
- › **Glenn McRae**, Executive Director, Clinical Compliance, Training & Standards, EMS, AHS.