

# Using a Prone/Supine Perception Survey and Literature Review to Forward the Conversation Regarding All Restraints

Jack C. Holden, PhD

Tiesha Johnson, MS

Michael Nunno, DSW

## ABSTRACT

The concern for safer physical restraints continues to permeate discussions for child and youth residential care facilities worldwide. The most controversial conversation appears to be centered in prone physical restraints versus supine physical restraints. In New York State, the Office of Mental Health (OMH) teaches the use of supine restraints and has banned the use of prone physical restraints in its licensed youth residential centers. The Office of Child and Family Services (OCFS) allow use of prone restraints in its licensed youth residential centers. Many youth residential centers are licensed by both agencies that had resulted in confusion and contradictions in training and program implementation. This quantitative study and literature review is designed to assess basic differences in physical and emotional risk, safety, efficiency, and training associated with using supine, prone, and all physical restraints. The data will be forwarded to the OMH and the OCFS for review to determine if a shift in the type of floor restraints is warranted.

## LITERATURE REVIEW

The research was conducted using MasterFile Premier, Academic Search Premier, ERIC, and PsycINFO databases,

## INTRODUCTION

Safety of both youth and staff during physical restraints is paramount for any conversation regarding restraints but even more challenging when using floor restraints (CWLA, 2002; Day, 2002, Holden et al., 2001). There has been relatively limited research comparing the use of restraints particularly the prone and the supine physical restraints. A perception survey was conducted with one agency in New York State that uses both the OCFS approved prone restraint and the OMH approved supine restraint and included staff who had experience using both techniques (n=54). The literature review represented 78 total articles, 48 were included in the study while 30 were excluded for reasons of non-relevance.

## METHODOLOGY

This quantitative study used a Likert scale to measure staff perception in one (1) agency currently using both a prone and supine restraint. The data collected for the study was derived from a staff perceptions survey and included the mean and paired sample correlations as well as an analysis of the variables (ANOVA). A narrative review of the literature was also incorporated.

Limitations for the perception study are:

- The sampling was from one agency and limited to about 20% of the total staff
- The agency had been using primarily prone restraints for years and the supine had been introduced in the past year
- Injury data was not available

Limitations for the literature review are:

- Some of the prone restraint data included hobble and “hog-tie” application of the prone restraint
- There is no apparent data available relevant to the number of restraints used in residential care settings comparing prone, supine, and other restraints
- A few of the reviewed data had limited research cites available

## RESULTS

(See Attached Tables)

## CONCLUSIONS

Conclusions were difficult to draw based on the information collected and analyzed. From the perception survey, the respondents indicated a preference for the prone restraint. The data from the participant perception surveys suggested the staff agreed that the prone restraint was safer, less risky, and easier to use, easier to learn and evoked less aggression and counter-aggression than the supine restraint. The literature review was less conclusive. There does seem to be agreement however, that all restraints present considerable risk to the youth, are intrusive to the youth, have a negative effect on the treatment environment, and have a profound effect on those youth who have experienced trauma in their lives. Additionally, other factors such as pre-existing physical/medical conditions may affect risk more than the type of restraint that is used.

## FURTHER WORK (RECOMMENDATIONS)

Based on the current literature available and the findings from the limited perception survey, additional extensive research remains to be done. First, a study should be initiated to determine the percentage of prone, supine, and other restraints currently being used in residential care. Next a comparison of injury data for all types of restraints should be initiated. Finally, the field might be most informed by studies related to youth perceptions of restraints, for those who reside in residential care and have been physically restrained.

**COMPARISON STUDY OF RESTRAINTS**  
Residential Child Care Project, Cornell University

<i>Questions</i>	<i>Prone/ Supine Perception Survey</i>		<i>Supporting Literature</i>		
	Prone	Supine	Prone	Supine	All Restraints
1. Increases Aggression	Disagree	Agree	<p>(Riley, 2006)</p> <p>Prone restraint is associated with violence and high-intensity observation after the incident.</p> <p>The prone position is said to aid in focusing disoriented patients and decreased aggression.</p>	<p>(Leadbetter, 2003; Protection &amp; Advocacy, Inc., 2002; Winston, 2004)</p> <p>Visual stimulation can escalate behavior. Severe psychological distress can lead to capture myopathy.</p>	<p>(Evans, 2002; Kennedy, 2000; Mohr, 2000)</p> <p>Restraints can contribute to existing agitation. Restraints can provide stimulus reminders of past abuse situations and can reactivate a hippocampus damaged by chronic increases in cortisol levels. Seen as a perceived threat and elicits a hyperarousal state.</p>
2. Increases counter-aggression	Disagree	No Opinion	No Data Found	No Data Found	<p>(Scottish Institute, 2005); (University of Stirling, 2000)</p> <p>Restraints cause anxiety for staff as well as children and can be traumatic for both. Client aggression can evoke staff counter/aggression</p>
3. Increases spitting	No Opinion	Strongly Agree	No Data Found	<p>(Winston, 2004)</p> <p>Position increases the likelihood of spitting.</p>	No Data Found
4. Produces longer restraints	Disagree	Agree	No Data Found	<p>(Winston, 2004)</p> <p>Supine restraints last longer than prone restraints. The visual stimulation can result in a longer restraint.</p>	No Data Found

Questions	Prone/ Supine Perception Survey		Supporting Literature		
	Prone	Supine	Prone	Supine	All Restraints
5. Has a negative effect on relationship	Disagree	Agree	(Scottish Institute, 2005) More likely to be perceived by the child as punishment.	No Data Found	(Bower, 2003; Kennedy, 2000); Scottish Institute, 2005; Smith, 1995; University of Stirling; Zun, 2004;) Patients believed that they were being punished even though nurses denied the accusation. Patients believed that restraints made the nurses feel powerful and nurses stated that they did not. Conduct disordered children have a damaged perception of adults to begin with therefore, physical interventions are over-interpreted. Feeling overpowered or punished can damage the staff-child relationship. Demoralization and loss of self-esteem. In patients with history of sexual abuse, the procedure is often perceived as re-victimization with the person or people implementing the restraint perceived as perpetrators.
6. Takes more than two (2) staff	Disagree	Strongly Agree	No Data Found	No Data Found	(AACAP, 2001; (JCAHO, 1998) Root cause analysis has indicated insufficient staffing levels related to incidents. All restraints require at least 2 people.
7. Needs to be conducted by experienced staff	No Opinion	Agree	No Data Found	No Data Found	(Goren, 1996; Kennedy, 2000;) Persistent use of restraints may be related to lack of confidence of staff and this influences the management of patients labeled as deviant.

Questions	Prone/ Supine Perception Survey		Supporting Literature		
	Prone	Supine	Prone	Supine	All Restraints
8. Has a negative effect on treatment environment	Disagree	No Opinion	No Data Found	No Data Found	(Bower, 2003; Mohr, 2000 Scottish Institute, 2005; Sourander, 2002; Vittengl, 2002;) With a history of abuse, restraints witnessed by other children can lead to a stress reaction related to a reminder of past trauma.
9. More risk of injury to youth	Disagree	No Opinion	<p>(Chan, 1997; Chan, 2004; Day, 2002; Dorfman, 2000; Joint Commission on Accreditation of Health Care Organizations (JCAHO); Mohr, 2000; Scottish Institute 2005; Schmidt, 1999; Winston, 2004)</p> <p>Appears to be a risk factor contributing to death. Higher risk of serious harm than supine techniques even when done correctly. The prone position along with contributing factors such as chest or torso compression, acute psychosis, exertion and obesity place the patient at risk for positional asphyxia. Prone restraint is more restrictive than supine. Prone position may predispose the patient for suffocation. The prone position is associated with the majority of restraint-related deaths. Any facedown position may prevent contraction of the diaphragm to some extent. The prone position reduces ventilatory volume and the ability to</p>	<p>(American Academy of Child and Adolescent Psychiatry (AACAP); Chan, 1998, (JCAHO, 1998; AACAP, 2001; Bettina, 2002; Brodsky, 2001; Brodsky, 2002; Gustafsson, 2003; Hick, 1999; Joint Commission on Accreditation of Health Care Organizations (JCAHO); Jonsson, 1984; Leadbetter, University of Stirling, 2003; O'Halloran, 2000; Parkes, 2002; Parkes, 2000; Patterson, nd; Peces-Barba, 2004; Scottish Institute, 2005)</p> <p>Supine position may predispose the patient for aspiration or choking. In the supine position, there is the actual weight of the heart on the left lung. The supine position leads to increased gas trapping in asthmatic children. The supine position may induce airflow obstruction in asthmatics. More risk for aspiration with the supine restraint. Supine obese patients have marked reductions in lung volume as well as increased intra-abdominal</p>	<p>Bower, 2003; Chan, 1997; Mohr, 2000; Parkes, 2002; University of Stirling;) Restraints can result in strangulation, psychological distress and death. Restraints can never be done without risk. Adverse effects of anticholinergic drugs mistaken for behavior can impair assessment. Stress of restraints and some psychotropic drugs can lead to fatal hyperpyrexia. Prolonged struggle and exertion can lead to rhabdomyolysis that can lead to acute renal failure and death. By itself, the restraint position was not associated with any clinically relevant changes in respiratory or ventilatory function in the population of healthy individuals with preserved ventilatory reflexes and normal pulmonary physiology. There is no evidence to suggest that hypo-ventilatory respiratory failure or asphyxiation occurs as a direct result of body position in healthy, awake non-intoxicated individuals with normal cardiopulmonary function at baseline. In cases where additional factors exist, the position of the restrained person may be more relevant. These factors</p>

<i>Questions</i>	<i>Prone/ Supine Perception Survey</i>		<i>Supporting Literature</i>		
	Prone	Supine	Prone	Supine	All Restraints
			<p>breathe. The prone position has been associated with increased pulse rate recovery time. Resistance of rib movement with the prone position. An obese person can have displacement of the abdomen. Prone can interfere with compensatory respiratory alkalosis when lactic acidosis occurs. The prone position is dangerous with or without the presence of co-existing conditions or risk factors. The prone position restricts chest wall movement. Alveolar volume is higher in the prone position. Compression of the abdomen causes compression of the inferior vena cava leading to decreased venous return to the heart. Carbon-monoxide diffusing capacity is lower in the prone position. Over long periods of time, the prone position induces increased heart rate, increased PVR and increases plasma nor-epinephrine.</p>	<p>pressure. Higher risk of choking or aspiration.</p>	<p>include extreme agitation, forceful and prolonged struggling, obesity, specific drugs, and pre-existing conditions. Any restraint places a child at risk for injury. Children are at a high risk for comotio cordis during take down. The catecholamine rush experienced during struggle can lead to a fatal arrhythmia. Psychological stress and medications that can prolong the QT interval can lead to a fatal arrhythmia. Complications include aspiration pneumonia, cardiac stress and accidental death. Compression to the upper body and inability to move in any position can lead to asphyxia.</p>
10. More risk of injury to staff	Disagree	Agree	No Data Found	No Data Found	No Data Found
11. More potential for safety violations	Disagree	No Opinion	No Data Found	No Data Found	No Data Found
12. More secure	No Opinion	No Opinion	No Data Found	No Data Found	No Data Found

Questions	Prone/ Supine Perception Survey		Supporting Literature		
	Prone	Supine	Prone	Supine	All Restraints
13. Safer for the youth	No Opinion	No Opinion	<p>(Albert, 2000; 2001; Brodsky, 2002; Joint Commission on Accreditation of Health Care Organizations (JCAHO); Mentzelopoulos, 2003; Mohr, 2000; Peces-Barba, 2004; Pelosi, 1996, 1995; Sawhney, 2005)</p> <p>It is easier to control a person in the prone position &amp; safer for the patient. Less risk of aspiration. Prone position requires less aspiratory pressure to perfuse the lungs, even with decreased diaphragmatic movement. The prone position has been shown to improve lung mechanics and oxygenation in patients with obstructive diseases such as asthma. The prone position improves pulmonary function and lung compliance in the obese patient. The prone position does not negatively affect respiratory mechanics and it improves lung volume and oxygenization. Although the prone position results in restrictive pulmonary function patterns, it does not result in clinically relevant changes in oxygenization or ventilation.</p>	No Data Found	<p>(Cein, 2005; Kohr, 2003; Mohr, 2000; Rodriguez, 2002; Zun, 2004)</p> <p>There is no significant difference in lung volume, tidal volume and breathing frequency among the positions. A restraint can be a therapeutic intervention if staff provides psychological and informational support throughout the intervention; uncaring attitude and behavior by staff results in increased struggle and can result in physical and psychological harm.</p>
14. Safer for the staff	Agree	Disagree	<p>(Dorfman, 2000)</p> <p>Safer for the staff.</p>	No Data Found	<p>(Mohr, 2000)</p> <p>Restraint places the staff at risk for injury.</p>

Questions	Prone/ Supine Perception Survey		Supporting Literature		
	Prone	Supine	Prone	Supine	All Restraints
15. Takes longer to learn	Disagree	No Opinion	No Data Found	No Data Found	(JACHO, 1998; Mohr, 2003) Root cause analysis indicates inadequate training of staff related to incidences. Improved patient care and outcomes can be the result of proper application by well-trained staff under clearly defined circumstances.
16. More difficult to maintain the skill	Disagree	No Opinion	No Data Found	No Data Found	(JCAHO, 1998) Root cause analysis indicates inadequate competency review related to incidences.
17. More likely to have injuries during training	Disagree	No Opinion	No Data Found	No Data Found	No Data Found
18. More difficult to perform with limiting physical conditions	Disagree	Agree	No Data Found	No Data Found	(Patrick vs NY) Case report revealed that an aid was unable to stay off of a patient's back during restraint because of knee problems.
19. More intrusive to the youth	Disagree	Agree	(Bower, 2003) Feelings of anger, being trapped, helpless, sad, powerlessness, frustration and embarrassment are abated more quickly in the prone position rather than the supine position.	(Protection & Advocacy, Inc., 2002) Position is said to be the most restrictive and intrusive.	(Allen, 2004; Gallop, 1999; Kennedy, 2000; Mohr, 2000; Nunno, 2006; Sailas, 2006;) All restraints are invasive procedures in general. Most patients recall and have aversive reactions to restraints. Restraints are not beneficial and are a noxious experience and are often perceived as punishment. Harmful or inappropriate use of restraints can be considered abusive. The experience of restraint for patients with a history of sexual abuse evokes fear, anxiety, rage and it is not seen as therapeutic even years later.

**PRONE/SUPINE PERCEPTION SURVEY RESULTS**  
**Residential Child Care Project**

Independent Variables	Paired Sample Statistics				Paired Sample Correlations		Paired Samples Test		Outcome
	Paired Responses	Mean	N	Std. Deviation	Std. Error Mean	Correlations	Sig.	t	Sig. 2-tailed
1. Prone increases aggression	2.22	54	1.003	.002	-.411	.002	-9.048	.000	Disagree
Supine increases aggression	4.06	54	.763	.147					Agree
2. Prone increases counter-aggression	2.19	54	.992	.005	-.200	.147	-5.631	.000	Disagree
Supine increases counter aggression	3.39	54	1.036	.005					No opinion
3. Prone restraint increases spitting	1.85	54	1.188	.162	-.376	.005	-15.357	.000	Disagree
Supine restraint increases spitting	4.89	54	.502	.068					Strongly agree
4. Prone restraints produces longer restraints	2.24	54	.910	.124	-.374	.005	-7.153	.000	Disagree
Supine restraints produces longer restraints	3.80	54	1.016	.138					Agree

Independent Variables	Paired Sample Statistics				Paired Sample Correlations		Paired Samples Test		Outcome
	Paired Responses	Mean	N	Std. Deviation	Std. Error Mean	Correlations	Sig.	t	Sig. 2-tailed
5. Prone has a negative effect on relationship	1.98	54	.901	.123	.090	.517	-8.964	.000	Disagree
Supine has a negative effect on relationship	3.61	54	1.071	.146					Agree
6. Prone takes more than two (2) staff	2.44	54	1.284	.175	-.289	.034	-12.264	.000	Disagree
Supine takes more than two (2) staff	4.91	54	.446	.061					Strongly Agree
7. Prone needs to be conducted by experienced staff	3.00	54	1.182	.161	-.573	.000	-5.594	.000	No Opinion
Supine needs to be conducted by experienced staff	3.78	54	1.003	.137					Agree
8. Prone has a negative effect on treatment environment	2.06	54	.834	.113	-.010	.944	-7.902	.000	Disagree
Supine has a negative effect on treatment environment	3.48	54	1.023	.139					No Opinion
9. Prone has more risk of injury to youth	2.24	54	.867	.118	-.245	.075	-3.874	.000	Disagree
Supine has more risk of injury to youth	3.02	54	1.000	.136					No Opinion

Independent Variables	Paired Sample Statistics				Paired Sample Correlations		Paired Samples Test		Outcome
	Paired Responses	Mean	N	Std. Deviation	Std. Error Mean	Correlations	Sig.	t	Sig. 2-tailed
10. Prone has more risk of injury to staff	2.07	54	1.025	.140	-.249	.069	-6.964	.000	Disagree
Supine has more risk of injury to staff	3.72	54	1.172	.160					Agree
11. Prone has more potential for safety violations	2.33	54	.932	.127	-.161	.246	-4.724	.000	Disagree
Supine has more potential for safety violations	3.22	54	.883	.120					No Opinion
12. Prone is more secure	3.39	54	1.089	.148	-.506	.000	1.440	.156	No Opinion
Supine is more secure	3.00	54	1.197	.163					No Opinion
13. Prone is safer for the youth	3.50	54	.863	.117	-.420	.002	3.125	.003	No Opinion
Supine is safer for the youth	2.78	54	1.144	.156					No Opinion
14. Prone is safer for the staff	3.59	54	1.296	.176	-.403	.002	4.830	.000	Agree
Supine is safer for the staff	2.19	54	1.260	.171					Disagree
15. Prone takes longer to learn	2.35	54	1.031	.140	-.226	.100	-3.792	.000	Disagree
Supine takes longer to learn	3.17	54	.986	.134					No Opinion

Independent Variables	Paired Sample Statistics				Paired Sample Correlations		Paired Samples Test		Outcome	
	Paired Responses	Mean	N	Std. Deviation	Std. Error Mean	Correlations	Sig.	t	Sig. 2-tailed	Likert Scale Survey
16. Prone is more difficult to maintain the skill	2.15	54	.810	.110						Disagree
Supine is more difficult to maintain the skill	3.19	54	.913	.124	.497	.000	-5.109	.000		No Opinion
17. Prone is more likely to have injuries during training	2.17	54	.906	.123						Disagree
Supine is more likely to have injuries during training	2.76	54	1.008	.137	.148	.285	-3.479	.001		No Opinion
18. Prone is more difficult to perform with limiting physical conditions	2.37	54	1.233	.168						Disagree
Supine is more difficult to perform with limiting physical conditions	3.85	54	1.017	.138	-.377	.005	-5.819	.000		Agree
19. Prone is more intrusive to the youth	2.26	54	1.085	.148						Disagree
Supine is more intrusive to the youth	3.81	54	1.065	.145	-.545	.000	-6.048	.000		Agree