

2008 LITERATURE REVIEW PRONE/SUPINE COMPARISON STUDY OF RESTRAINTS

<i>Theory</i>	<i>Supporting Literature</i>		
	Prone	Supine	All Restraints
1. Increases Aggression	(Riley, 2006) Prone restraint is associated with violence and high-intensity observation after the incident. The prone position is said to aid in focusing disoriented patients and decreased aggression.	(Leadbetter, 2003; Protection & Advocacy, Inc., 2002; Winston, 2004) Visual stimulation can escalate behavior. Severe psychological distress can lead to capture myopathy.	(Evans, 2002; Kennedy, 2000; Mohr, 2000) 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.
s2. Increases counter-aggression	No Data Found	No Data Found	(Scottish Institute, 2005); (University of Stirling, 2000) Restraints cause anxiety for staff as well as children and can be traumatic for both. Client aggression can evoke staff counter/aggression
3. Increases spitting	No Data Found	(Winston, 2004) Position increases the likelihood of spitting.	No Data Found
4. Produces longer restraints	No Data Found	(Winston, 2004) Supine restraints last longer than prone restraints. The visual stimulation can result in a longer restraint.	No Data Found
5. Has a negative effect on	(Scottish Institute, 2005) More likely to be perceived by	No Data Found	(Bower, 2003; Kennedy, 2000); Scottish Institute, 2005; Smith, 1995; University of Stirling; Zun,

relationship	the child as punishment.		<p>2004; Ferleger, 2008)</p> <p>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.</p>
6. Takes more than two (2) staff	No Data Found	No Data Found	<p>(AACAP, 2001; (JCAHO, 1998)</p> <p>Root cause analysis has indicated insufficient staffing levels related to incidents. All restraints require at least 2 people.</p>
7. Needs to be conducted be experienced staff	No Data Found	No Data Found	<p>(Goren, 1996; Kennedy, 2000; Bigwood & Crowe, 2008))</p> <p>Persistent use of restraints may be related to lack of confidence of staff and this influences the management of patients labeled as deviant.</p>

<p>8. Has a negative effect on treatment environment</p>	<p>No Data Found</p>	<p>No Data Found</p>	<p>(Bower, 2003; Mohr, 2000 Scottish Institute, 2005; Sourander, 2002; Vittengl, 2002; Ferleger, 2008)</p> <p>With a history of abuse, restraints witnessed by other children can lead to a stress reaction related to a reminder of past trauma.</p>
<p>9. More risk of injury to youth</p>	<p>(Chan, 1997; Chan, 2004; Day, 2002; Dorfman, 2000; Harvey, 2007; Joint Commission on Accreditation of Health Care Organizations (JCAHO); Mohr, 2000; Nelstrop, 2006; Scottish Institute 2005; Schmidt, 1999; Whittington et.al, 2006; 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</p>	<p>(American Academy of Child and Adolescent Psychiatry (AACAP); Chan, 1998, (JCAHO, 1998; AACAP, 2001; Bettina, 2002; Brodsky, 2001; Brodsky, 2002; Gustafsson, 2003; Harvey, 2007; Hick, 1999; Joint Commission on Accreditation of Health Care Organizations (JCAHO); Jonsson, 1984; Leadbetter, University of Stirling, 2003; Nelstrop, 2006; O'Halloran, 2000; Parkes, 2002; Parkes, 2000; Patterson, nd; Peces-Barba, 2004; Scottish Institute, 2005; Whittington et. Al., 2006)</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</p>	<p>Bower, 2003; Chan, 1997; Mohr, 2000; Parkes, 2002; University of Stirling; Ferleger, 2008)</p> <p>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</p>

	<p>position may prevent contraction of the diaphragm to some extent. The prone position reduces ventilatory volume and the ability to 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>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 pressure. Higher risk of choking or aspiration.</p>	<p>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 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	No Data Found	No Data Found	No Data Found
11. More potential for safety violations	No Data Found	No Data Found	No Data Found
12. Less secure	No Data Found	No Data Found	No Data Found
13. Less safe for the youth	<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 & 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</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>

	oxygenization. Although the prone position results in restrictive pulmonary function patterns, it does not result in clinically relevant changes in oxygenization or ventilation.		
14. Less safe for the staff	(Dorfman, 2000) Safer for the staff.	No Data Found	(Mohr, 2000) Restraint places the staff at risk for injury.
15. Takes longer to learn	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	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	No Data Found	No Data Found	No Data Found
18. More difficult to perform with limiting physical conditions	No Data Found	No Data Found	(Patrick vs NY) Case report revealed that an aid was unable to stay off of a patients back during restraint because of knee problems.
19. More	(Bower, 2003)	(Protection & Advocacy, Inc.,	(Allen, 2004; Gallop, 1999;

<p>intrusive to the youth</p>	<p>Feelings of anger, being trapped, helpless, sad, powerlessness, frustration and embarrassment are abated more quickly in the prone position rather than the supine position.</p>	<p>2002) Position is said to be the most restrictive and intrusive.</p>	<p>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.</p>
-------------------------------	---	---	--

Prone/Supine Research Bibliography

- Albert RK, Hubmayr RD. The prone position eliminates compression of the lungs by the heart. *Am J Respir Crit Care Med* 2000 May; 61(5):1660-5.
- Allen MH, Currier GW. Use of restraints and pharmacotherapy in academic psychiatric emergency services. *Gen Hosp Psychiatry* 2004 January; 26 (1):42-9.
- Bigwood, S. & Crowe, M. 'It's a part of the job, but it spoils the job': a phenomenological study of physical restraint. *International Journal of Mental Health Nursing* 2008;(17) 215-222.
- Bower FL, McCullough CS, Timmons ME. A synthesis of what we know about the use of physical restraints and seclusion with patients in psychiatric and acute care settings: 2003 update. *Online J Knowl Synth Nurs* 2003 April 22;10:1.:1.
- Brodsky JB, Oldroyd M, Winfield HN, Kozlowski PM. Morbid obesity and the prone position: a case report. *J Clin Anesth* 2001 March;13(2):138-40.
- Brodsky JB. Positioning the morbidly obese patient for anesthesia. *Obes Surg* 2002 December;12(6):751-8.
- Cary NRB, Roberts CA, Cummin ARC, Adams L. The effect of simulated restraint in the prone position on cardiorespiratory function following exercise in humans. *Journal of Physiology* 2000;525P:30P-1P.
- Chan TC, Vilke GM, Neuman T, Clausen JL. Restraint position and positional asphyxia. *Ann Emerg Med* 1997 November;30(5):578-86.
- Chan TC, Vilke GM, Neuman T. Reexamination of custody restraint position and positional asphyxia. *Am J Forensic Med Pathol* 1998 September;19(3):201-5.
- Chan TC, Neuman T, Clausen J, Eisele J, Vilke GM. Weight force during prone restraint and respiratory function. *Am J Forensic Med Pathol* 2004 September;25(3):185-9.
- Chien WT, Chan CW, Lam LW, Kam CW. Psychiatric inpatients' perceptions of positive and negative aspects of physical restraint. *Patient Educ Couns* 2005 October;59(1):80-6.
- Day P. What evidence exists about the safety of physical restraint when used by law enforcement and medical staff to control individuals with acute behavioral disturbance? *New Zealand Health Technology Assessment Brief Series* 2002;1(3).

- Dorfman DH. The use of physical and chemical restraints in the pediatric emergency department. *Pediatr Emerg Care* 2000 October;16(5):355-60.
- Duchess County Court of Claims Claim No.106599. Patrick v. State of New York. *New York Law Journal* 2006.
- Evans D, FitzGerald M. Reasons for physically restraining patients and residents: a systematic review and content analysis. *Int J Nurs Stud* 2002 September;39(7):735-43.
- Ferleger, D. Human services restraint: its past and future. *Intellectual and Developmental Disabilities* 2008 April;46(2):154-165.
- Gallop R, McCay E, Guha M, Khan P. The experience of hospitalization and restraint of women who have a history of childhood sexual abuse. *Health Care for Women International* 1999;20:401-16.
- Goren S, Curtis WJ. Staff members' beliefs about seclusion and restraint in child psychiatric hospitals. *J Child Adolesc Psychiatr Nurs* 1996 October;9(4):7-14.
- Gustafsson PM. Pulmonary gas trapping increases in asthmatic children and adolescents in the supine position. *Pediatr Pulmonol* 2003 July;36(1):34-42.
- Hick JL, Smith SW, Lynch MT. Metabolic acidosis in restraint-associated cardiac arrest: a case series. *Acad Emerg Med* 1999 March;6(3):239-43.
- Joint Commission on Accreditation of Healthcare Organizations. Preventing restraint deaths. *Sentinel Event Alert* 1998 November 18;(8):1-3.
- Jonsson E, Mossberg B. Impairment of ventilatory function by supine posture in asthma. *Eur J Respir Dis* 1984 October;65(7):496-503.
- Kennedy SS, Mohr WK. A prolegomenon on restraint of children: implicating constitutional rights. *Am J Orthopsychiatry* 2001 January;71(1):26-37.
- Kohr RM. Inflicted compressional asphyxia of a child. *J Forensic Sci* 2003 September;48(5):1148-50.
- Lancaster, G., Whittington, R., Lane, S., Riley, D., & Meehan, C. Does the position of restraint of disturbed psychiatric patients have any association with staff and patient injuries? *Journal of Psychiatric and Mental Health Nursing* 2008;(15):306-312.
- Leadbetter D. The debate on prone restraint. *CALM - Crisis, Aggression, Limitation and Management* 2003; Available at: URL: <http://www.bild.org.uk/pdfs/03behaviour/restraint.pdf>.

- Masters KJ, Bellonci C, Bernet W et al. Practice parameter for the prevention and management of aggressive behavior in child and adolescent psychiatric institutions, with special reference to seclusion and restraint. *J Am Acad Child Adolesc Psychiatry* 2002 February;41(2 Suppl):4S-25S.
- Mentzelopoulos SD, Zakynthinos SG, Roussos C, Tzoufi MJ, Michalopoulos AS. Prone position improves lung mechanical behavior and enhances gas exchange efficiency in mechanically ventilated chronic obstructive pulmonary disease patients. *Anesth Analg* 2003 June;96(6):1756-67, table.
- Mohr WK, Mohr BD. Mechanisms of injury and death proximal to restraint use. *Arch Psychiatr Nurs* 2000 December;14(6):285-95.
- Mohr WK, Petti TA, Mohr BD. Adverse effects associated with physical restraint. *Can J Psychiatry* 2003 June;48(5):330-7.
- Musch G, Layfield JD, Harris RS et al. Topographical distribution of pulmonary perfusion and ventilation, assessed by PET in supine and prone humans. *J Appl Physiol* 2002 November;93(5):1841-51.
- Nunno M, Holden M, Tollar A. Learning from Tragedy: A Survey of child and adolescent restraint fatalities. *Child Abuse & Neglect: The International Journal*. In press 2006.
- O'Halloran RL, Frank JG. Asphyxial death during prone restraint revisited: a report of 21 cases. *Am J Forensic Med Pathol* 2000 March;21(1):39-52.
- Parkes J. Sudden death during restraint: a study to measure the effect of restraint positions on the rate of recovery from exercise. *Med Sci Law* 2000 January;40(1):39-44.
- Parkes J. A review of the literature on positional asphyxia as a possible cause of sudden death during restraint. *The British Journal of Forensic Practice* 2002;4(1):24-30.
- Paterson B. Improving the physical and psychological safety of physical interventions in care settings. *University of Stirling, Department of Nursing and Midwifery* 2006.
- Peces-Barba G, Rodriguez-Nieto MJ, Verbanck S, Paiva M, Gonzalez-Mangado N. Lower pulmonary diffusing capacity in the prone vs. supine posture. *J Appl Physiol* 2004 May;96(5):1937-42.
- Pelosi P, Croci M, Calappi E et al. The prone positioning during general anesthesia minimally affects respiratory mechanics while improving functional residual capacity and increasing oxygen tension. *Anesth Analg* 1995 May;80(5):955-60.

- Pelosi P, Tubiolo D, Mascheroni D et al. Effects of the prone position on respiratory mechanics and gas exchange during acute lung injury. *Am J Respir Crit Care Med* 1998 February;157(2):387-93.
- Protection & Advocacy Inc. The Lethal Hazard of Prone Restraint: Positional Asphyxia. *Protection & Advocacy, Inc* 2002; Available at: URL: <http://www.pai-ca.org/index.htm>.
- Rodriguez-Neito MJ, Peces-Barba G, Mangado N, Gonzalez, Paiva M, Verbanck S. Similar ventilation distribution in normal subjects prone and supine during tidal breathing. *Journal of Physiology* 2002;92:622-6.
- Sailas E, Fenton M. Seclusion and restraint for people with serious mental illnesses. *Cochrane Database Syst Rev* 2000;(2):CD001163.
- Sawhney A, Kumar N, Sreenivas V, Gupta S, Tyagi V, Puliyeel JM. Prone versus supine position in mechanically ventilated children: a pilot study. *Med Sci Monit* 2005 May;11(5):CR235-CR240.
- Schmidt P, Snowden T. The effects of positional restraint on heart rate and oxygen saturation. *J Emerg Med* 1999 September;17(5):777-82.
- Smith SB. Restraints: retraumatization for rape victims? *J Psychosoc Nurs Ment Health Serv* 1995 July;33(7):23-8.
- Sourander A, Ellila H, Valimaki M, Piha J. Use of holding, restraints, seclusion and time-out in child and adolescent psychiatric in-patient treatment. *Eur Child Adolesc Psychiatry* 2002 August;11(4):162-7.
- The Scottish Institute for Residential Care. Holding safety: A guide for residential child care practitioners and managers about physically restraining children and young people. 2005.
- University of Stirling DoNaM. Only When there is no alternative: Improving safety in physical interventions in care settings. 2006.
Ref Type: Generic
- van Doeselaar, M, Slegers, P., Hutschemackers, G. Professionals' attitudes toward reducing restraint: the case of seclusion in the Netherlands. *Psychiatric Quarterly* 2008 January; (79): 97-109.
- Vittengl JR. Temporal regularities in physical control at a state psychiatric hospital. *Arch Psychiatr Nurs* 2002 April;16(2):80-5.
- Winston M, Fleisig N. The role of prone immobilizations in crisis management: Clinical importance and common misconceptions. *Professional Crisis Management* 2004.
- Zun LS. Evidence-based treatment of psychiatric patient. *J Emerg Med* 2005 April;28(3):277-83.

