

Hip Spica Nursing Care Evidence Table:

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Methods, key findings, outcomes or recommendations
<p>Bae, D.S., Valim, C., Connell,P., Brustowicz, K.A., & Waters, P.M. (2017). Bivalved Versus Circumferential Cast Immobilization for Displaced Forearm Fractures: A Randomized Clinical Trial to Assess Efficacy and Safety. Journal of Pediatric Orthopaedics, 37 (4), 239-246</p>	<p>Method:</p> <ul style="list-style-type: none"> · From 2009 to 2011, a randomized clinical trial of all patients presenting to a level 1 pediatric trauma center with displaced forearm fractures was performed. · Skeletally immature children between 4 and 16 years of age with displaced distal or mid-diaphyseal radius and/or ulna fractures requiring CR and cast immobilization were eligible. · subjects were randomized to either bivalved or circumferential casts in a 1:1 ratio; treatment allocation was determined by drawing from prepackaged, sealed envelopes with assignments made based on an agestratified (4 to 10 y and 11 to 16 y) randomized block design. <p>Outcomes: There were no differences in remanipulation/surgery rates, radiographic LOR, or final radiographic alignment in patients treated with bivalved versus circumferential above-elbow casts. 2 patients required conversion to bivalve casts due to pain and swelling, there were no documented cases of compartment syndrome or permanent neurovascular compromise. The overall rate of cast saw injury was approximately 0.5%. The risk of late displacement and need for remanipulation remains, there are no significant differences in maintenance of reduction, need for surgery, or complications between bivalve or circumferential above-elbow casts.</p> <p>Implications for guideline:</p> <ul style="list-style-type: none"> · immobilization carries the risk of neurovascular compromise and/or compartment syndrome. · With impending or evolving neurovascular compromise, prompt cast removal and surgical fracture stabilization is recommended. · Although neurovascular compromise is rare, the potential functional consequences are considerable. For this reason, bivalving casts after CR of acute fractures has been advocated. · cast saw use on the acutely injured, swollen limb carries a risk of saw burns and thermal injury. · the reduction in compartment syndrome risk with bivalving is assumed but has not been studied. · little to no published information is available regarding the effect of bivalving in pediatric patients treated for acute fractures of the forearm or distal radius
<p>Clarke, S., & McKay, M. (2006). An audit of spica cast guidelines for parents and professionals caring for children with developmental dysplasia of the hip. Journal of Orthopedic Nursing, 10, 128-137.</p>	<ul style="list-style-type: none"> ·An audit of parents and health professional's information on spica cast care specific to children with DDH. · Baseline assessment using audit and questionnaire which can be then used in future to assess efficacy of clinical guidelines. · 73% of parents had to contact the hospital for advice or reassurance · Parents wanted troubleshooting information and general spica cast guidelines following discharge · Both groups needed the leaflet to include pictures <p>Implications for Guideline: Both health care professionals and parents need thorough education. An audited guideline which provides specific information regarding spica care for health professionals:</p>

	<ul style="list-style-type: none"> · Check the condition of the cast and skin regularly · Change position regularly-2 hourly during the day and 4 hourly overnight until the cast is dry and support with pillows · Nappies should be changed more regularly · The cast should be firm and fitsnuggly · When dry a reinforcing layer can be applied. · Eat smaller meals and place patient in upright position
<p>Dachang, F., Zhaofa, L., Haito, C., Huanhuan, W. (2022). Clinical efficacy and safety of ibuprofen plus traction, reposition and hip spica cast in the treatment of developmental dysplasia of the hip. Evidence-Based Complementary and Alternative Medicine. https://doi.org/10.1155/2022/1213133</p>	<p>Methods. Between January 2019 and July 2020, 60 children with DDH treated in department of orthopedics of our institution were assessed for eligibility and recruited. They were assigned at a ratio of 1 : 1 to receive either traction + reposition + hip spica cast plus analgesia pump (observation group) or traction + reposition + hip spica cast plus analgesia pump and oral ibuprofen (control group). The outcome measures included clinical efficacy, pain scores, unexpected pain calls, the dosage of analgesia pump, and adverse events.</p> <p>Results. The two groups had similar clinical efficacy. The patients given oral ibuprofen were associated with significantly lower pain scores at 24 h and 72 h postoperatively versus those without oral ibuprofen. Analgesics with oral ibuprofen resulted in fewer unexpected pain calls versus analgesics without oral ibuprofen within 72h postoperatively. The application of oral ibuprofen in the analgesia pump showed great improvement in lowering the dosage of analgesia pump versus the absence of ibuprofen. The incidence of adverse events was similar between the two groups of patients.</p> <p>Conclusion. Traction + reposition + hip spica cast plus analgesia pump and oral ibuprofen effectively mitigated postoperative pain in children with DDH and reduces analgesic drug dosage with a high safety profile.</p>
<p>Di Fazio, R., Vessey, J., Zurakowski, D., Hresko, M., & Matkney, T. (2011). Incidence of skin complications and associated charges in children treated with hip spica casts for femur fractures. Journal of pediatric orthopedics. Vol 31(1), 17-22. DOI: 10.1097/BPO.0b013e3182032075</p>	<p>Background: Spica cast immobilization remains the treatment of choice for femur fractures in children aged 6 months to 6 years. The incidence of skin complications and their associated charges have not been well described. This study's purposes were to: (1) determine the rate of skin complications in children treated with spica casts for femur fractures, (2) identify predictors, and (3) calculate the charges associated with skin complications.</p> <p>Methods: Health records for all patients treated with immediate spica casting for a femur fracture at a major tertiary-care children's hospital from 2003 to 2009 were reviewed and relevant data were abstracted. Descriptive statistics and univariate and multiple logistic regression analyses were used to compare children with and without skin complications and to identify predictors of skin complications. The total charges for skin complications leading to a cast change and early bivalving and lining were calculated.</p> <p>Results: Of the 300 spica cast applications in 297 patients, 77 subjects (28%) had skin complications. Twenty-four (31%) of these 77 patients underwent a cast change in the operating room, 34 (44%) required early bivalving and lining and 19 (25%) required cast trimming and/or skin care. Predictors of skin complications included: child abuse as mechanism of injury, younger age, and cast time more than 40 days. Sex, weight, fracture location, and total number of clinic visits were not statistically significant predictors of skin complications. The median charge for patients who required cast changes for skin complications was \$12,719 (\$8632 to \$53,768), whereas the median charge for bivalving and lining was \$416.51 (\$403.32 to \$449.00).</p> <p>Conclusions: Spica cast treatment is associated with numerous skin complications and additional charges. Victims of child abuse may benefit from additional clinical oversight. Future research needs to investigate patient education and casting interventions that reduce skin complications.</p>

<p>Gockley, A., Hennrikus, W., Lavin, S.T., Rzucidlo, S., & Rieghard, C. (2015). Transportation of children in spica casts in the USA. <i>Journal of Pediatric Orthopedics B</i>, 24 (4), 277-280.</p>	<p>Aim & Method: To report the outcomes of children transported in spica casts in terms of safety and complications, and to report the additional costs associated with a car seat loaner program that adheres to the AAP guidelines. This study was performed at an academic hospital in Pennsylvania and involved a chart review of 52 patients with orthopaedic disorders that required application of a spica cast.</p> <p>Key Points</p> <ul style="list-style-type: none"> · Pediatric orthopedic patients in spica casts require treatment for their transportation needs. · The American Academy of Pediatrics guidelines use weight as the criteria selection of appropriate restraining device. <p>Key Findings</p> <ul style="list-style-type: none"> · 18% of patients were transported home by ambulance as they could not be safely restrained in the available car seats or lived in families that did not own a car. · 23% of patients had a delay in discharge due to difficulties arranging safe transportation in the spica cast. · No accidents were reported. · The most common barrier to using appropriate restraints was rental costs. · Parental compliance with recommended car seats/restraints improved with the implementation of a car seat loan program. · Recommendations: implementation of a hospital loaner program for car seats and restraints; hospitals should use a hospital van to transport some children with special needs rather than paying the cost of ambulance transportation; training of multiple medical assistants, nurses, and therapists can reduce a delay in discharge due to lack of available trained therapists to fit car seats (especially over the weekend).
<p>Herman, M.J., Abzug, J.M., Krynetskiy, E.E., & Guzzardo, L.V. (2011). Motor vehicle transportation in hip spica casts: Are our patients safely Restrained? <i>Journal of Pediatric Orthopaedics</i>, 31(4), 465-468.</p>	<ul style="list-style-type: none"> · 31 children recruited · Concluded that the majority of children in hip spica casts are not safely restrained when traveling in a car. · Of the 31 children only 31% were transported by the method recommended on discharge and therefore 69% were not properly restrained. · Limited financial resources of families were the primary reason for failing to use the correct restraint type. Use of a loan system or financial assistance may improve compliance. · Better parental education is needed to improve compliance <p>Implications: Many patients were not being safely restrained highlighting the importance of properly fitting the patient and educating the parents on using the appropriate restraint advised. Loaner programs help improve compliance with appropriate car seating method</p>
<p>Horn, P.L., & Badowski, E. (2015). Postoperative Spica Cast Care: RN Comfort-Level Survey Score Improvement After a 30- Minute Educational Video. <i>Orthopedic Nursing</i> 34, (6), 334- 337.</p>	<p>Method: the development and implementation of an educational tool that would build competence in spica cast care in nurses, thereby reducing skin complications.</p> <ul style="list-style-type: none"> · Spica casts are used to immobilize paediatric patients who have sustained femur fractures of undergone hip surgery. · Casts usually stay in place for 4-6 weeks. · Improper postoperative care can lead to unplanned, increased morbidity. · A spica cast is applied to part or the entire trunk of the body or part/all of one or more extremities. <p>Patients at risk for skin complications include those in inconsistent foster care, inappropriate home care, those who aren't toilet-trained, and transportation issues for follow-up care.</p>

	<ul style="list-style-type: none"> · Health-care costs for patients with skin injuries due to hip spicas was significantly higher than for those without skin injuries. · A waterproof tape is used in the groin area and should stay in place for the duration of the cast and replaced only if soiled. · Future research is required to investigate patient education and casting interventions that reduce skin complications. <p>Key findings:</p> <ul style="list-style-type: none"> · Patients who were found to have a higher incidence of abrasions, macerated skin, rashes, and/or fungal infections, had inappropriately placed waterproof tape and moleskins pieces (petals). · There was a statistically significant improvement in nurses' comfort level with spica cast care post education. · Cast techs in the orthopaedic clinic noted that cast care was consistently appropriate after RN education. · There were no adverse skin events related to spica cast care 5 months after the education project.
<p>McDowell, M., Nguyen,S., & Schlechter, J. (2014). A comparison of various contemporary methods to prevent a wet cast. <i>Journal of Bone and Joint Surgery American</i>, 96 (99), 1-5.</p>	<p>Method: An experimental study was performed utilizing casts that were applied in a uniform standardized manner onto a plastic mannequin model. No human subjects were used.</p> <p>The aim of the study was to compare contemporary methods to protect casts from water by assessing effectiveness, costs, and ease of use. Findings suggest that each method tested was effective in preventing most of the water absorption. The double plastic bags with duct tape is the most effective, most user-friendly and most cost-effective way to protect casts from water.</p>
<p>Newman, D.M., & Fawcett. (1995). Caring for a young child in a body cast: impact on the care giver. <i>Orthopaedic Nursing</i>, 14(1), 41-46.</p>	<ul style="list-style-type: none"> · Sample size of 30 mothers who were the primary care giver for a child in a hip spica. · Mothers found it impossible to continue usual household, social and community activities without the help of familymembers. · Mothers reported being "frightened," "tired," and "overwhelmed" · Mothers repeatedly cited the need for more information about caring for their child at home. · Mothers reported problems such as skin excoriation due to urine leakage, and odor and skin problems due to excretions seeping into casts. · Positioning and lifting were a problem for most mothers. Half of the mothers reported back aches, muscle pain and shoulder aches. · Appropriate car seat and wheel chair access issues were identified by mothers. · Significant feelings of social isolation expressed by mothers. <p>Implications: Caring for a child in a hip spica is stressful for parents. Nurses need to ensure parents have good family supports in place. Thorough parental education on cast care is essential. Study identifies importance of proper lifting. Nurses themselves need to ensure appropriate transferring of patient to prevent back injury and also need to educate parents on appropriate lifting. Physiotherapy or occupational therapy may be required. Incontinence issues and cast care are important issues in nursing care and education.</p>
<p>Reed, C., Carroll, L., Baccari, S., & Shermont, H. (2011). Spica cast care. A collaborative staff led education initiative for improved patient care. <i>Orthopaedic Nursing</i>, 30(6), 353-358</p>	<ul style="list-style-type: none"> · One of the most challenging aspects of caring for incontinent children in hip spicas is maintaining healthy skin integrity · Described the nurse led initiative to change practice in view of an increase in phone calls about and readmissions for rash, skin breakdown, and foul smelling casts. · Common practice throughout children's hospitals for spica cast diapering included the use of an absorbable pad and tucked diaper. · Staff and parent education programs have potential to decrease incidence of skin breakdown.

<p>Roberts, A., Shaw, A., Boomsma, S.E., & Cameron, C.D. (2015). Effect of casting material on the cast pressure after sequential cast splitting, 37 (1), 74-77.</p>	<p>Cast immobilization can cause complications that include joint stiffness from prolonged immobilization, pressure sores and skin breakdown, thermal injury from cast placement, cast saw burns sustained during removal, and compartment syndrome.</p> <ul style="list-style-type: none"> · tight bandaging has the potential to cause prolonged blockage in arterial flow, resulting in ischemia and contracture · A 75% pressure decrease occurred with the cotton padding group following cast bivalve, with an additional 10% decrease after the padding was released. · The decrease in pressure after releasing the cast padding was more significant for the synthetic (20%) and waterproof padding groups (25%). · The application of a loose elastic bandage after complete release of the cast elevated the cast pressure to a point that was significantly higher than the cast pressures after cutting the cast padding. · The degree of pressure elevation varied based upon padding type with synthetic and waterproof cast padding groups demonstrating higher pressures than the cotton padding groups. · Although compartment syndrome is relatively rare, it is a serious complication that should be considered in all populations, especially those who are unable to alert the care provider
<p>Sparks, L., Ortman, M.R., & Aubuchon, P. (2004). Care of the child in a body cast. Journal of Orthopaedic Nursing, 8, 231- 235. DOI: 10.1016/j.joon.2004.09.003</p>	<ul style="list-style-type: none"> · Present information gained from literature, internet resources, the authors experience and parents of the child. · Practical advice for nurses and parents. · Parents need both verbal and written instructions from nurses. · It is extremely important to examine the child's skin at least twice a day. · Parents and nurses should assess child's circulation and sensation · The edges of the cast should be made smooth with waterproof tape. · The cast needs to be protected from urine and stool. · Need frequent nappy changes. · An inner pad should be tucked under the cast and covered with a larger nappy for babies. · Older children can use bedpans and bottles · Constipation can be an issue for the child in a body cast. · The child can be positioned supine, prone, or side lying and should be turned at least four times a day. · All children need to be secured properly when riding in automobiles. · Nurses need to consider the family's strengths, limitations and needs in providing discharge education
<p>Tabaie, S., Cho, K., Tarawneh, O., Sadur, A., & Shah, A. (2022). Evaluating Postoperative Immobilization Following Hip Reconstruction in Children with Cerebral Palsy</p>	<ul style="list-style-type: none"> ● A retrospective cohort study of pediatric patients with cerebral palsy who underwent hip reconstructive procedures, in which a hip spica cast, Petrie cast, or abduction pillow was placed for postoperative hip immobilization, was conducted. ● Patients who underwent revision surgery and those without cerebral palsy were excluded from the analysis. ● The final cohort consisted of 70 cases. ● Of the 70 patients, 27 received spica casting, 28 received Petrie casting, and 15 received an abduction pillow. ● The complication rates, as defined in the methods section, were 14.8% for the spica cast group, 17.9% for Petrie cast, and 26.7% for abduction pillow. ● There was no significant difference in complication rates among spica cast, Petrie cast, or abduction pillow groups.

	<ul style="list-style-type: none"> • There was no significant difference in length of stay, pain control duration, or complication rates among the three methods of immobilization. Clinicians should be advised of the comparable outcomes among the postoperative immobilization techniques.
<p>Yap, S., et al. (2021). Can paediatric femoral fracture hip spica application be done in the outpatient setting?. Malaysian Orthopaedic Journal; Vol: 15(1), 105-112. DOI: 10.5704/MOJ.2103.016</p>	<p>Introduction: Hip spica casting is a standard treatment for children with femur fractures. This study compares the outcomes of spica cast application, in terms of quality of fracture reduction and hospital charges when performed in operating theatre versus outpatient clinics at a local institution.</p> <p>Materials and Methods: A total of 93 paediatric patients, aged between 2 months to 8 years, who underwent spica casting for an isolated femur fracture between January 2008 and March 2019, were identified retrospectively. They were separated into inpatient or outpatient cohort based on the location of spica cast application. Five patients with metaphyseal fractures and four with un-displaced fractures were excluded. There were 13 and 71 patients in the outpatient and inpatient cohort respectively who underwent spica casting for their diaphyseal and displaced femur fractures. Variables between cohorts were compared.</p> <p>Results: There were no significant differences in gender, fracture pattern, and mechanism of injury between cohorts. Spica casting as inpatients delayed the time from assessment to casting, increased average hospital stay and average hospital charges. Excluding the un-displaced fractures, there were no significant differences in the period of cast immobilisation and median follow-up length. Both cohorts had a similar proportion of unacceptable reduction and revision casting rate.</p> <p>Conclusion: Both cohorts presented similar spica casting outcomes of fracture reduction and follow-up period. With spica cast application in operating theatre reporting higher hospital charges and prolonged hospital stay, the outpatient clinic should always be considered for hip spica application.</p>
<p>Zielinski, J., Oliver, G., Sybesma, J., Walter, N., & Atkinson, P. (2009). Casting technique and restraint choice influence child safety during transport of body casted children subjected to a simulated frontal MVA. The Journal of Trauma, 66, 1653- 1665. DOI: 10.1097/TA.0b013e3181a4c0f4</p>	<ul style="list-style-type: none"> · Children fitted into casts may not fit into traditional car seats requiring alterations to the seat or restraint. · Study conducted to provide data describing the influence of a hip spica cast during transportation of small children in the event of a frontal motor vehicle accident. · In general traditional child restraints accommodate children in hip spica however the addition of the hips spica increases the majority of injury metric magnitudes. · Study demonstrated that there are varied effects on basic physiologic functions for body casted children based on the method of restraint. · Restraints which place the child forward facing with the face in proximity to the cast should be avoided · Based on mixed results of study unable to advocate or oppose different seating positions · Overall best performance for 12 month age was observed with traditional car seat or lying down with a lap and shoulder belt. However this would be catastrophic in a side on collision. · While unable to provide clear recommendations due to variability in results some results alarming in adverse effect on child and therefore still need to be acknowledged. <p>Implications: Specific instructions should be communicated to parents before discharge by the child seat technician to ensure proper fit and function during subsequent transport. Study unable to conclude the effect the presence of hip spica has on different restraints and how it impacts the child's safety, however highlights the vigilance needed in ensuring appropriate fitting of care seats.</p>

