



Nursemaid's elbow: Its diagnostic clues and preferred means of reduction

This systematic review revealed that correcting the injury with pronation is more successful and less painful than supination.

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PRACTICE RECOMMENDATIONS

➤ Nursemaid's elbow typically occurs with a sudden pull on a child's arm. Reserve radiography for uncertain cases in which you need to exclude more severe injuries. **(B)**

➤ Consider reducing nursemaid's elbow by rapid pronation of the forearm, which has been shown to be less painful and more effective than supination. **(A)**

Strength of recommendation (SOR)

- (A)** Good-quality patient-oriented evidence
- (B)** Inconsistent or limited-quality patient-oriented evidence
- (C)** Consensus, usual practice, opinion, disease-oriented evidence, case series

Nursemaid's elbow—sudden subluxation of the radial head—usually results from forcible traction to a child's pronated hand or wrist, with the elbow extended.¹ Ironically, this can occur when a parent tries to maneuver a child away from perceived danger, and the child experiences pain and acute loss of function of the affected limb.²

Nursemaid's elbow reportedly occurs frequently among children,^{3,4} and thus we would expect to encounter it often in primary care. However, this condition receives little attention in medical training or in the literature, and many physicians do not recognize it.⁴⁻⁶

In this article we describe the epidemiology, underlying pathology, diagnosis, and treatment of nursemaid's elbow, based on a systematic review of the current literature.

Methods

Literature search

Using PubMed and Embase, we conducted a literature search for articles published in Dutch, English, German, or French from 1966 through July 2007 on the topic of nursemaid's elbow in children. We used as search terms all known synonyms for nursemaid's elbow—eg, radial head subluxation, partial epiphyseal separation of the radial head, pulled elbow, baby-sitter's elbow, curbstone fracture, etc. Publications cited in our initial search were also checked for relevance. Articles were reviewed and judged independently by 2 authors (M.K. and J.C.v.d.W.).

Articles we selected focused on proximal radial subluxation. We excluded articles on distal radial subluxation and luxation of the radius.

The 2 reviewers assessed the quality of articles on treat-

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 The cause of injury is usually a tug on the arm; the child then holds the arm slightly flexed and pronated.

ment using the validated Jadad score,⁷ where in a maximum of 5 points may be awarded:

- 1 point if the study is described as randomized:
 - 1 point added for appropriate method of randomization
 - 1 point deducted for inappropriate randomization
- 1 point if the study is described as double-blind:
 - 1 point added for appropriate method of blinding
 - 1 point deducted for inappropriate blinding
- 1 point for a description of withdrawals or dropouts.

No cutoff limit for Jadad scores was planned as a criterion for exclusion. As it is not possible to treat nursemaid's elbow in a double-blind fashion, 3 was the highest possible score in our study.

Results

Our literature search produced 368 potentially relevant papers; of these, 60 met our inclusion criteria. The reference lists of selected studies and reviews yielded an additional 25 acceptable papers, each covering various aspects of the topic (epidemiology, 19; pathology, 10; diagnosis, 10; treatment, 9). Thirty-seven of the 85 selected papers were review articles.

Epidemiology

Most reports agree that nursemaid's elbow is a frequent injury among children.^{4,8-10} Unfortunately, published population-based incidence rates are scarce; only 1 article gives an occurrence rate in the total population—1.2%.¹¹ Most epidemiologic data are derived from case series, which show a predominance of injury among girls and to the left arm. Most cases occur at a median age of about 2 years.^{2-5,8}

Pathology

The many synonyms of nursemaid's elbow reflect a once obscure understanding of its pathology. Among initial reports from the 1800s, the focus was on determining whether the injury occurred at the wrist or the elbow.¹² Subsequent studies showed that the mechanism of injury usually is a tug on the pronated

arm^{5,13-16} of young children (who have relatively lax tissue), thereby pulling the radius through the annular ligament,¹³⁻¹⁵ which may partially tear and (with the meniscoid synovial fold) become entrapped between the radial head and the capitellum.¹⁵ Most commonly a parent or other caregiver is holding the child by the hand while walking and suddenly pulls the child away from a dangerous situation or merely drags the child up a curb or a step.¹

Diagnosis

We found no clinical studies that assessed the value of physical examination or history taking. The only studies relevant to diagnosis discussed radiography.

Nursemaid's elbow is an easily recognized diagnosis based on the history and physical examination.¹⁷ Still, it seems many physicians do not recognize the condition.⁴⁻⁶ Typically, a parent reports that the child cried out after a pull on the arm and then refused to use the arm, holding it slightly flexed and pronated.¹⁸ Pain may be felt only at the wrist or shoulder.^{3,18} Occasionally, a snap or click is heard when the accident happens.⁵ The elbow can usually be flexed and extended, but the child resists supination of the forearm, which causes pain in the elbow. There is no swelling or bruising.¹⁹

Children are often referred for radiographic examination with the observation, "refuses to use arm; please x-ray from shoulder to wrist."²⁰ Radiography is of little help, however, and exposes the child to a dose of ionizing radiation. Although some studies show small significant differences between nursemaid's elbow and the normal elbow,²¹⁻²³ radiographic results generally are reported as normal.^{4,6,8,24} (Some commentators assume this may occur if the radiology technician repositions the arm in an attempt to obtain a true anteroposterior projection of the elbow.^{1,18,25}) Restrict radiography, therefore, to cases with an unclear history or a history of trauma other than arm pull, to exclude more severe injuries.

The role of sonography is not yet clear, but it may turn out to be a fast and harmless technique for diagnosing uncertain cases.^{20,25,26}

Treatment

Although no articles have described the natural course of nursemaid's elbow, most authors

report that it resolves on its own when a child moves the arm in supination or pronation. It is so easily treated that parents of children with recurrent episodes have even been instructed by phone how to perform the reduction.²⁷

Most articles and textbooks recommend reducing nursemaid's elbow by a rapid supination of the forearm, followed by flexion or extension.^{9,28} However, some articles have described a pronation method.²⁹ We found 2 high-quality trials that compared the success rate of the supination method with the pronation method.^{30,31} Researchers conducting 1 medium-quality trial assessed the difference in pain experienced with these 2 methods.³² And researchers conducting 1 low-quality trial tried to assess whether splinting after manipulation helps to prevent recurrences of nursemaid's elbow.¹⁰

These trials indicate the pronation method is more successful. In addition, some stud-

ies report that the pronation method is less painful for the child and less frightening for a parent to watch.²⁹⁻³¹ Green et al confirmed this in their randomized trial.³²

Most compelling finding

The highest quality studies were those devoted to treatment,^{28,30-33} and the clear conclusion from their findings—in contrast to what textbooks recommend—is that reduction with a pronation maneuver is more often successful than the supination method. Of course more studies will be needed before textbooks change their recommendations. But at least these studies provide helpful guidance now. **JFP**

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Restrict x-ray use to cases with an unclear history or those that are due to trauma other than an arm pull.