

# Commentary: Preparing Young Children for Medical Procedures: Taking Account of Memory

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The importance of preparation for children undergoing medical procedures has long been recognized in pediatric psychology. Indeed, 30 years ago, Melamed and Siegel (1975) stated that “there is a consensus that all children need some kind of psychological preparation for the hospital experience” (p. 511). The aims of preparation are typically twofold; to inform the child of the details of the experience, and to teach effective coping strategies. Whereas in earlier approaches, children were provided with procedural information and demonstration of the experience, recent interventions have involved the child and parent actively in cognitive behavioral “packages.” Typical elements include coaching in coping skills, modeling by a coping peer (via video or slideshow), and behavioral rehearsal using role plays or props (e.g., a doll) (Powers, 1999). Cognitive behavioral approaches have received consistent empirical support as a means of reducing distress (for reviews, see Blount, Piira, & Cohen, 2003; Kazdin & Weisz, 1998; Kuppenheimer & Brown, 2002; Powers, 1999). Nonetheless, we know little about the mechanisms by which such interventions are effective (Dahlquist, 1999), limiting our ability to make optimal decisions concerning their use.

In considering how best to implement preparatory interventions, there is much to be gained from examining children’s memory of medical procedures. Within pediatric psychology, a nascent but important body of research informs us that the way that children remember a procedure has significant implications for their management of future medical encounters. For example, Chen and colleagues showed that children (aged 3- to 18 years) who were distressed during a lumbar puncture (LP) developed exaggerations in memory for its negative

aspects, which, in turn, were associated with heightened distress during the next LP. Importantly, distress during the following LP was reduced if, by way of preparation, the children were helped to reappraise and modify their negatively exaggerated memories (Chen, Zeltzer, Craske, & Katz, 1999, 2000). These findings highlight a two-way association between children’s memory and their distress (for reviews, see Ornstein, Manning, & Pelphrey, 1999; von Baeyer, Marche, Rocha, & Salmon, 2004). They also show that memories of medical procedures provide a window into children’s understanding and appraisal of their experience, and that this can be modified by preparation.

In designing optimal preparatory interventions, it is also timely to consider the findings of research investigating the influence of pre-event information on young children’s memory for events. Although developmental research has considerable implications for pediatric psychology, as noted by Dahlquist (1999) conceptual issues have often been overshadowed by the need to establish effective interventions. This small body of research has greatest relevance for children undergoing a novel medical procedure, with which the child has no prior experience. In the typical paradigm, the researchers stage a novel event (e.g., visiting the “pirate” or the “pretend zoo”), having provided information in advance. The children are interviewed after a delay to assess their knowledge, understanding, and evaluation of the experience, reflected in their memory of it. The impact of preparation is assessed relative to a control condition (in which children received information unrelated to the event) (McGuigan & Salmon, 2004, 2005; Sutherland, Pipe, Schick, Murray, & Gobbo, 2003).

This article is a commentary on “Brief Report: Optimizing Children’s Memory and Management of an Invasive Medical Procedure: The Influence of Procedural Narration and Distraction by Salmon, McGuigan, and Pereira (2006)” from a previous issue of the *Journal of Pediatric Psychology* (doi:10.1093/jpepsy/jsj081).

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*Journal of Pediatric Psychology* 31(8) pp. 859–861, 2006

doi:10.1093/jpepsy/jsj072

Advance Access publication August 31, 2005

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What do the findings tell us? First, pre-event information presented verbally via adult-child discussion has a relatively limited impact on young children's memory. This is so even if the preparatory information is provided just one day before the experience, with the children being interviewed 2 weeks later. Second, to significantly benefit memory, discussion about the event must be supplemented with visual information (e.g., photographs). Third, eliciting the child's participation in the preparation by asking him/her to generate the information adds to the impact of verbal preparation accompanied by visual information (McGuigan & Salmon, 2005). Finally, the preparatory information must be related specifically to the event, rather than related generally to the topic, even when supplemented by some visual information (Sutherland et al., 2003).

One reason that discussion about an upcoming unique event may not have been especially effective in the studies to date is that the children have been quite young (3 to 7 years), and the verbal information is likely to have been only weakly encoded and not well integrated with the event itself (Sutherland et al., 2003). The encoding of pre-event information may be further compromised by the children's limited ability to reason about future relative to past experiences, particularly for novel events for which the child has no generic "script," derived from general knowledge or prior experience (Hudson, 2002). For these young children, encoding is likely to be improved by those manipulations that provide material specific to the experience in multiple modalities (e.g., videos, photographs), as occurs in empirically supported interventions and that encourage the child's active participation (e.g., responding to questions about the preparatory material).

A number of questions have not yet received research attention. One relates to the optimal means of supplementing verbally presented information. Dolls and toys may not be helpful in preparatory interventions with very young children. As demonstrated by experimental research, preschoolers have difficulty understanding the relation between the toys and their referents, particularly when the toy is a doll representing the child himself/herself. That toys and dolls are not specific to the medical procedure will also limit their effectiveness (e.g., DeLoache & Marzolf, 1995). A further question concerns the timing of the preparation in relation to the procedure. Although findings suggest that providing preparatory information in close temporal proximity to the procedure may increase children's distress (Blount et al., 2003; but see Spafford, von Baeyer, & Hicks, 2002), a long delay may preclude the child's

linking the preparation to the procedure. Systematic research with children of different ages can help to clarify both the effectiveness of various means of conveying preparatory information and also the "time window" within which pre-event information boosts children's memory and understanding while reducing their distress.

The implications for pediatric settings are twofold. First, research investigating the conditions under which pre-procedural information influences young children's memory of a medical experience can benefit the design of optimal preparatory strategies. Preparation will not be effective if the child does not make the link between the preparatory information and the procedure itself. It is of concern, then, that narrative preparation and play therapy continue to be widely used across a range of procedures (O'Byrne, Peterson, & Saldana, 1998). Second, assessment of children's memory for medical procedures following preparatory interventions can yield important information about the extent to which the intervention has achieved its aims of increasing the child's understanding of the experience, reducing his or her distress, while also eliminating memory errors.

Received March 29, 2005; revision received July 31, 2005; accepted August 8, 2005

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