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*Child Health: The role of nutrition in virus mutation;
Sleep behaviors and later learning*

From the Director's Office: Health and Well-Being

Lullabye and Good-Night

Looking Beyond the Basics

The Mystery of the Virus

NCEDL News

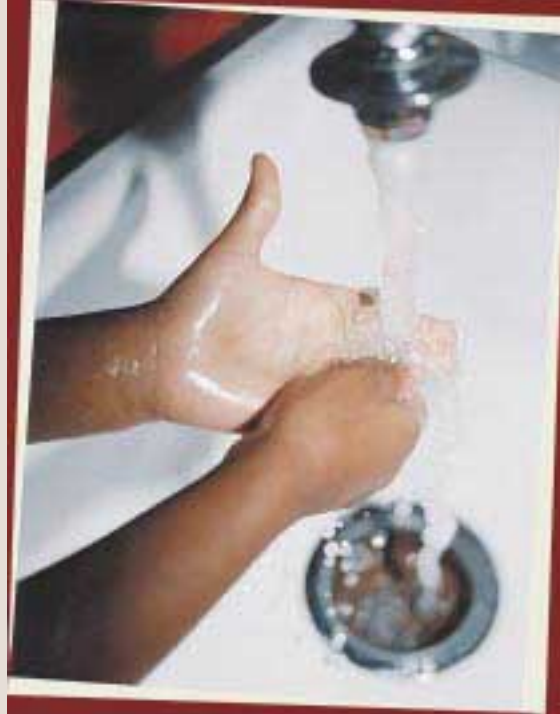
Research Spotlight

Helping children breathe easier

Respiratory infections are still the major health problem in child care settings

The prevention of respiratory infections in child care centers remains a public health challenge, according to a paper delivered during a synthesis conference on "Research Into Practice in Infant/Toddler Care" held in the fall of 1997 by the National Center for Early Development & Learning (NCEDL).

Drs. Albert M. Collier and Frederick W. Henderson, both pediatricians at the University of North Carolina at Chapel Hill, said a survey of current literature reveals "no published data describing a successful intervention to reduce the risk of upper respiratory diseases in day care centers." Both are also FPG fellows.



14

Research, including work done for more than 30 years at FPG's own child care center, shows that viral respiratory tract infections peak during the second six months of life, between seven months and one year of age. During this period, the level of antibodies is at its lowest in life. That's because of the decreasing level of antibodies passed across the placenta from the child's mother during pregnancy and the fact that it takes the child's immune system about two years to begin producing antibody levels approaching those of a mature child.

Children under the age of three who attend child care have more respiratory infections than children of the same age who are cared for at home. The severity of these infections in young children is also greater. Children who are routinely in contact with only three children daily rather than 30 children have less of a chance of coming into contact with an infectious agent. Children attending child care will be infected with viral respiratory infections earlier than children living at home with no siblings in school.

National studies in the news

at a high level to pass across the placenta to the newborn. As the mother's passive antibodies disappear, the child might then be immunized with new vaccines against common respiratory pathogens.

The researchers predicted that in the near future vaccine development will certainly focus on the respiratory syncytial, parainfluenza, and influenza viruses. "Adenoviruses could also be an important target for prevention," they said.

Curiously enough, they said, a synthesis of research shows no evidence that excluding sick children from a child care center reduces the incidence of acute respiratory disease. Children with viral respiratory infections excrete the infectious virus four to five days before they show signs and symptoms of the infection.

- In another study by FPG researchers, a hygienic intervention was conducted at a random selection of child care centers at the same time as another random group of centers received no intervention. The intervention included such things as:
- handwashing of children & staff
- disinfecting the toilet & diapering area
- physical separation of diapering area from food preparation & service areas
- hygienic diaper disposal
- daily washing & disinfecting of toys, sinks, kitchen & bathroom floors
- daily laundering of blankets, sheets, dress-up clothes, other items
- hygienic preparing, serving and clean-up of food.

- Respiratory infections account for 75% to 90% of infections in child care settings, according to several large studies. In an FPG study of 206 children followed for 864 child-years, infants less than a year old had an average of nine respiratory illnesses a year of which 46% were associated with otitis media and 13% with lower respiratory manifestations.
- Collier and Henderson suggested that one strategy for future research in the control of respiratory tract infections in child care would be to increase the individual child's immunity to the most important respiratory agents. This should be approached first by making sure that the children and child care staff are fully vaccinated on schedule for vaccine-preventable respiratory illness.
- Second, research could focus on maternal immunization during pregnancy to optimize the level of antibodies in the mother to a particular respiratory tract pathogen. Passive antibodies would then be

No significant difference in the rates of illness from respiratory tract infections was found in centers with interventions and those without. 

Keeping children healthy outside the home

Researchers cite ways to help control diarrhea in out-of-home child care

The rate of diarrheal disease in children cared for out of the home is two to three times that in children cared for at home, according to a presentation sponsored by the National Center for Early Development & Learning (NCEDL). One study puts the mean cost per episode of diarrhea at \$289, while another finds an average cost of \$172 per child-year.

These findings were presented during a "Research Into Practice in Infant/Toddler Care" synthesis conference by NCEDL in the fall of 1997 in Chapel Hill, NC. Drs. Robin B. Churchill and Larry K. Pickering presented their data and surveyed current literature for their paper, "Health Issues in the Context of Out-of-Home Child Care: Diarrheal Disease in Infants and Toddlers." Both are affiliated with Eastern Virginia Medical School, Norfolk.


An increased rate of diarrheal disease has been shown to occur in children newly enrolled in child care centers, and this is likely due to exposure to pathogens not previously found in the home environment, the researchers said.

Studies, including those at FPG, show that fecal contamination in infant and toddler areas of child care environments is common. Dry surfaces, diapering areas and bathroom sinks and faucets were less likely to be contaminated than the hands of children and staff, classroom sinks and faucets, and toys.

Classrooms with high levels of coliform bacteria on the hands of staff also tend to have high levels on the hands of the children, researchers said.

Several studies, including one by FPG researchers, show that training in hygienic practices including handwashing and diapering techniques resulted in a decrease in severe diarrhea in classrooms caring for children under 24 months.

The researchers said that education of child care providers and parents in handwashing and other hygienic practices and strict adherence to these practices remain "the cornerstone of prevention and control of diarrheal disease in the child care setting."


Vaccines against only two gastrointestinal-tract pathogens have been approved by the U.S. Food and Drug Administration (FDA), but neither is considered important in the child care setting. "Vaccines against enteric pathogens, especially viral agents, represent a promising means of control in the future," the researchers said. The FDA is considering an orally administered vaccine for prevention of rotavirus, a virus commonly implicated in outbreaks of diarrhea in child care settings. 



Pickering & Churchill suggest the following measures to help control and prevent diarrheal disease in child care environments...

- ✦ In child care centers, food preparation areas should be completely separate from diapering and toilet areas.
- ✦ Diaper-changing areas should never be used for temporary placement of food.
- ✦ There should be an adequate number of sinks adjacent to child-size toilets and diapering areas.
- ✦ The use of potty chairs should be discouraged.
- ✦ The use of automated faucet-handle-free handwashing sinks should be considered because they may aid in decreasing fecal contamination.
- ✦ Surfaces should be designed and built for ease of cleaning. For example, diaper-changing surfaces should be nonporous to allow adequate sanitization between uses.
- ✦ Facilities should allow separation of children by age group. Children in diapers especially should be separated from toilet-trained children.
- ✦ Written handwashing procedures and sanitation policies should be available to all staff and procedures should be enforced.
- ✦ Interventions involving parents and the community can be a valuable adjunct in controlling enteric diseases in child care centers. Education on hygienic practices on a community-wide basis has been shown effective in controlling community outbreaks of shigellosis associated with child care centers.

They also suggested that the management of children with diarrhea and control of diarrheal outbreaks in the child care setting include...

- ✦ excluding children with diarrhea from the center
- ✦ grouping infected children in a separate area with separate staff
- ✦ excluding new admissions temporarily
- ✦ offering alternative care arrangements including referral to a sick care center
- ✦ closing a center temporarily if all other measures fail. 

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Research spotlight

Recent findings at FPG

Early Intervention & Mediating Processes in Cognitive Performance of Children of Low-Income African American Families

Margaret R. Burchinal, Frances A. Campbell, Donna M. Bryant, Barbara H. Wasik, and Craig T. Ramey.
Child Development, 68(5), pp. 935–954.

This longitudinal study of 161 African American children from low-income families examined multiple influences—including early childhood interventions and characteristics of the child and family—on longitudinal patterns of children’s cognitive performance measured between 6 months and 8 years of age. These children were part of the original Abecedarian study at FPG, and this is a new analysis of data already collected.

Results indicate that children with higher IQs over time tended to have had high-quality child care, responsive and stimulating care at home, and mothers with higher IQs. Findings suggested that child care experiences were related to better cognitive development, in part, because children who received more responsive and stimulating child care became more responsive and

interested in the people and objects in their world. Maternal IQ had both a direct effect on cognitive development during early childhood and an indirect effect through its influence on the family environment.

Early childhood education in a quality care facility and the quality of the family environment were both related to higher child test scores over time, even after adjusting for maternal IQ.

Results indicated that neither the selected characteristics of the mother nor family environment moderated the child care intervention effects. These results in conjunction with results from other intervention studies suggest that responsive care beginning in infancy and continuing through entry to kindergarten may be necessary to achieve long-term child care

effects on cognitive outcomes. These results provide further evidence of the malleability of cognitive performance during early childhood.

In contrast to much previous work, the family environment and the child care intervention both remained substantial predictors in the analysis models even at the last assessment at 8 years of age.

In conjunction with other Abecedarian studies and Carolina Approach to Responsive Education project papers, these results provide clear evidence that intensive, high-quality, child care interventions can change the developmental trajectories of cognitive performance and enhance academic outcomes for African American children from low-income families.