

## Manuscript Details

<b>Manuscript number</b>	JPHC_2017_16
<b>Title</b>	Caring for Our Children Health and Safety Standards Into Child Care Practice: Child Care Health Consultation Improves Infant and Toddler Care
<b>Article type</b>	Research paper
<b>Keywords</b>	child care; child care health consultation; infants and toddlers; health and safety
<b>Taxonomy</b>	Toddlers, Health Promotion, Child Care, Infants
<b>Corresponding Author</b>	Rosemary Johnston
<b>Corresponding Author's Institution</b>	PA Chapter American Academy of Pediatrics/ECELS
<b>Order of Authors</b>	Rosemary Johnston, Beth DelConte, Libby Ungvary, Richard Fiene, Susan Aronson

## Submission Files Included in this PDF

### File Name [File Type]

Cover Letter.docx [Cover Letter]

Ethical Statement.docx [Ethical Statement]

v32 ITQIP Article.docx [Manuscript File]

Figure 1 - Evaluation Plan Logic Model.docx [Figure]

Figure 2 - Crossover Comparison Results.docx [Figure]

Table 1 - CFOC3 Standards Chosen for ITQIP.docx [Table]

Table 2 - Scoring Responses on the Evaluation Tool.docx [Table]

Table 3 - Topic Areas.docx [Table]

Title Page.docx [Title Page (with Author Details)]

To view all the submission files, including those not included in the PDF, click on the manuscript title on your EVISE Homepage, then click 'Download zip file'.

# American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



## ***Pennsylvania Chapter***

Rose Tree Corporate Center II  
1400 N. Providence Road  
Suite 3007  
Media, PA 19063-2043  
Phone: 484/446-3000  
800/337-2227  
Fax: 484/446-3255  
Email: [paaap@paaap.org](mailto:paaap@paaap.org)  
[www.paaap.org](http://www.paaap.org)

## ***Executive Board***

### *President*

**Denise Salerno, M.D., FAAP**  
Email: [salernod@tuhs.temple.edu](mailto:salernod@tuhs.temple.edu)

### *Vice President*

**Deborah Moss, M.D., M.P.H., FAAP**  
Email: [Deborah.moss@chp.edu](mailto:Deborah.moss@chp.edu)

### *Secretary/Treasurer*

**Barbara Ostrov, M.D., FAAP**  
Email: [bostrov@hmc.psu.edu](mailto:bostrov@hmc.psu.edu)

## ***Members at Large***

**Amanda W. Brown, M.D., FAAP**  
Email: [Amanda.Brown@chp.edu](mailto:Amanda.Brown@chp.edu)

**Esther Chung, M.D., M.P.H., FAAP**  
Email: [echung@nemours.org](mailto:echung@nemours.org)

**Kenneth Keppel, M.D., FAAP**  
E-mail: [Kenneth.keppel@chp.edu](mailto:Kenneth.keppel@chp.edu)

**C. Eve Kimball, M.D., FAAP**  
E-mail: [ekimball@aacp.com](mailto:ekimball@aacp.com)

**Jarret R. Patton, M.D., FAAP**  
Email: [Jarret\\_R.Patton@lvhn.org](mailto:Jarret_R.Patton@lvhn.org)

**Steven A. Shapiro, D.O., FAAP, FACOP**  
E-mail: [stevenshapiro@gmail.com](mailto:stevenshapiro@gmail.com)

**Justin Schreiber, D.O., M.P.H., FAAP**  
Email: [schreibwerj@upmc.edu](mailto:schreibwerj@upmc.edu)

**Allison Horowitz, M.D., FAAP**  
Email: [arhorow@gmail.com](mailto:arhorow@gmail.com)

## ***Immediate Past President***

**Sue Kressly, M.D., FAAP**  
Email: [skressly@kresslypediatrics.com](mailto:skressly@kresslypediatrics.com)

## ***Executive Direct***

**Joe Casey, CAE**  
Email: [jcasey@paaap.org](mailto:jcasey@paaap.org)

January 17, 2017

Martha Kirk Swartz, PhD, RN, CPNP, FAAN  
Editor-in-Chief, *Journal of Pediatric Health Care*

Dear Dr. Swartz:

I am Director of the Early Childhood Education Linkage System (ECELS), a program of the PA Chapter of the American Academy of Pediatrics. We just completed a 3- year study in which we evaluated the linkage of Child Care Health Consultants with early childhood education centers to improve infant and toddler health and safety with a focus on 13 specific *Caring for Our Children* 3<sup>rd</sup> Ed. National Health and Safety Performance Standards (CFOC3). As indicated in your email reply of November 26, 2016, the manuscript would be of possible interest to the readership of the *Journal of Pediatric Health Care*.

I am submitting the manuscript and required documents today through Elsevier Editorial System. Rosemary Johnston is the corresponding author and her email is [rljrmj@msn.com](mailto:rljrmj@msn.com)

Please contact Rosemary or myself if needed. Thank you for your interest in our study findings.

Libby Ungvary, MEd  
PA AAP/ECELS Director  
[lungvary@paaap.org](mailto:lungvary@paaap.org)

## Ethical Statement

*Caring for Our Children* Health and Safety Standards into Child Care Practice: Child Care Health Consultation Improves Infant and Toddler Care

The authors have no disclosures to report.

1 *Caring for Our Children* Health and Safety Standards into Child Care Practice: Child Care  
2 Health Consultation Improves Infant and Toddler Care  
3

4 ABSTRACT  
5

6 Introduction: The Pennsylvania Chapter of the American Academy of Pediatrics (PA AAP)  
7 recruited 37 infant-toddler (I/T) child care centers to participate in a health and safety quality  
8 improvement initiative.

9 Method: The centers were assigned alternately to an Immediate Intervention or a one-year  
10 Delayed Intervention (Contrast) group. The intervention was linkage of the center with a Child  
11 Care Health Consultant (CCHC). Project staff selected 13 standards from a list provided by the  
12 Maternal and Child Health Bureau(MCHB) from *Caring for Our Children: National Health and  
13 Safety Performance Standards, 3<sup>rd</sup> ed. (CFOC3)* An independent evaluator assessed performance  
14 of the standards in the participating centers at project entry, 1 year and 2 years later. In the  
15 second year, in a cross-over comparison, each of the Contrast centers was linked with a CCHC.

16 Results: The results demonstrated that working with a CCHC effectively improved performance  
17 of selected health and safety standards.  
18

19 MANUSCRIPT

20 INTRODUCTION  
21

22 In 2013, the Pennsylvania Chapter of the American Academy of Pediatrics (PA AAP) received a  
23 3-year grant from the Maternal and Child Health Bureau [MCHB]. The purpose of the grant was  
24 to “improve state infant/toddler [I/T] child care quality initiatives (Quality Rating and  
25 Improvement Systems [QRIS] and professional development) ...” by selecting and promoting  
26 incorporation of 10 or more standards from a list that MCHB chose from *Caring for Our  
27 Children: National Health and Safety Performance Standards; Guidelines for Early Care and  
28 Education Programs, 3rd ed. [CFOC3] (American Academy of Pediatrics et al. [AAP], 2011)*.  
29 The PA AAP’s program, the Early Childhood Education Linkage System [ECELS], administered  
30 the grant.  
31

32 The I/T Quality Improvement Project [ITQIP] (1) assessed child care center practices related to  
33 I/T care defined in 13 selected *CFOC3* standards, (2) assessed whether compliance with these  
34 practices improved when centers were linked with a CCHC, (3) advocated for adoption of  
35 *CFOC3* standards for I/T practices in Pennsylvania’s Quality Rating Improvement System,  
36 Keystone STARS.  
37

38 Child care programs in Keystone STARS are ranked from lowest, Star 1 to highest, Star 4. To  
39 earn a STAR rating, programs must comply with state regulations and meet requirements for the  
40 designated STAR level listed on the PA Key website, [www.pakeys.org](http://www.pakeys.org). For a STAR 4 rating, a  
41 center must have scores at or above “good” on the 7 subscales of the *Infant and Toddler  
42 Environment Rating Scale-Revised Edition [ITERS –R]* (Harms, Cryer, & Clifford, 2006).  
43 Some health and safety items are in the Personal Care Routines sub-scale of ITERS-R. Scores in  
44 this subscale and on health and safety items in some of the other subscales are among the lowest  
45 scoring ITERS-R items in Pennsylvania and elsewhere. This finding is reported by the

46 *Pennsylvania Key-Program Quality Assessment Team* (Pennsylvania Key, 2016) and confirmed  
47 by the authors of ITERS-R (Personal communication by Harms and Cryer to S. Aronson).

48 CCHCs use observation, education, collaborative decision-making, coaching and mentoring to  
49 achieve quality improvement in the QRIS (Zaslow, Tout & Halle, 2012). CCHCs base their work  
50 on identified needs and feasible implementation. Published research studies over more than a  
51 decade confirm child care health consultation is an effective approach to improving health and  
52 safety performance in child care. (Alkon & Bernzweig, 2008; Alkon et al. 2008; Alkon,  
53 Bernzweig, Kim, Wolff, & Mackie, 2009; Alkon et al, 2014, Alkon et al. 2016; Alkon, Sokal-  
54 Gutierrez & Wolf, 2002; Banghart & Kraeder, 2012; Carabin et al, 1999; Cole, 2008; Crowley,  
55 2006; Isabell et al 2013; Moon & Oden, 2005; Organizational Research Services & Geo  
56 Education& Research, 2007; Pacific Research & Evaluation, 2007; Ramler, Nakatsukasa-Ono,  
57 Loe & Harris, 2006; Roberts et al, 2000a; Roberts et al, 2000b) Most of these studies involved  
58 small numbers of infants and toddlers, as many centers enroll mostly preschool age children.  
59 These studies documented the following specific improvements associated with involvement of a  
60 CCHC:

- 61 • Improved sanitation and hygiene reduced respiratory and gastrointestinal illness and  
62 days absent for illness among young children in group care (Carabin et al, 1999; Kotch  
63 et al, 2007; Roberts et al, 2000a; Roberts et al, 2000b).
- 64 • Adoption of nationally recommended practices related to active play, nutrition and food  
65 handling (Alkon et al, 2014).
- 66 • Adoption of policies and procedures with associated staff training to reduce hazards  
67 resulted in fewer injuries (Kotch, 2002; Organizational Research Services and Geo  
68 Education & Research, 2007).
- 69 • Training about safe infant sleep positioning and the infant sleep environment was  
70 associated with reduced risk of Sudden Infant Death Syndrome (Moon & Oden, 2005;  
71 Cole, 2008).
- 72 • Better monitoring and tracking of immunization data in child care programs resulting in  
73 more children having up-to-date vaccine documentation (Alkon & Bernzweig, 2008).

74 The Early Childhood Education Linkage System (ECELS) was established as a program of the  
75 PA AAP in 1989. ECELS maintains a Child Care Health Consultant Registry and regularly  
76 communicates with registered CCHCS to provide professional development, technical assistance  
77 and tools to enable their implementation of the CCHC role. Pennsylvania's CCHCs are private  
78 and public health service providers and academics. Funding for CCHC work is unpredictable,  
79 making recruitment and retention of CCHCs challenging.

80  
81 ECELS encourages child care centers that serve 25 or more children to use a well-tested and  
82 routinely updated online software application called WellCareTracker™ to check child health  
83 records for up-to-date routine health services. It is described, demonstrated and offered for  
84 subscription at [www.wellcaretracker.org](http://www.wellcaretracker.org). Using WellCareTracker™ eases the burden for child  
85 care providers to comply with Pennsylvania's regulation to document that enrolled children are  
86 up to date with preventive health services recommended by the AAP. The regulation is not

87 enforced; few providers subscribe or use any other way to ensure enrolled children have received  
 88 nationally recommended preventive health services.

89

## 90 **METHODOLOGY**

91

### 92 **Selection of the CFOC3 standards to address in ITQIP**

93 With input from early care and education stakeholders ECELS prioritized and chose 13 of the  
 94 standards from the MCHB list (Table 1). The selection criteria were that the standard is: a)  
 95 associated with the highest and most common risks of harm to I/T, b) measurable and amenable  
 96 to improvement with technical assistance and professional development provided by a CCHC  
 97 over a 12-month period, and c) highlighted by state data showing high levels of non-compliance.  
 98 An evaluation tool was developed to measure compliance with the selected 13 standards.

99

100 Table 1: *CFOC3* Standards Chosen for ITQIP

101

### 102 **Recruitment and retention of centers, roles of center staff, evaluators and CCHCs**

103

104 **Centers:** ECELS recruited Keystone STAR 2 and STAR 3 centers to participate in ITQIP that  
 105 wanted to qualify for higher star levels. Programs with higher STARS levels qualify for higher  
 106 payments for enrolled children whose care is state subsidized.

107

108 As the centers joined ITQIP, the project Coordinator assigned them alternately to one of the two  
 109 groups, either the Immediate Intervention Group or the Delayed Intervention (Contrast) group.  
 110 ITQIP enrolled centers from all but one of the 5 Keystone STARS state regions; the Northwest  
 111 region has the fewest centers and none were recruited.

112

113 The distribution of the 37 recruited centers among other 4 Keystone STARS regions was: 6  
 114 Southwest (Pittsburgh metropolitan area); 8 South Central (Harrisburg metropolitan area); 16  
 115 Southeast (Philadelphia metropolitan area); and 7 Northeast (Allentown/Bethlehem/Scranton).  
 116 As an incentive for participating in ITQIP, centers were offered 3 free \$10 credit-awarding  
 117 reviews of ECELS self-learning modules, and reduced fees to use WellCareTracker™ to assess  
 118 child health records in their programs. Of the 37 centers, 26 remained in ITQIP for all 3 years of  
 119 the project.

120

121 The enrolled centers agreed to the following:

122

123

124

125

126

127

128

129

130

131

132

**Evaluators:** ITQIP recruited 17 evaluators. The evaluators learned how to use the evaluation tool by participating in a live webinar or by using the recording of the webinar. All evaluators

133 received a copy of the evaluation tool and a manual with instructions for completing the  
134 evaluation. None of the evaluators who were CCHCs were linked with centers they evaluated.  
135

136 The evaluators gave their completed evaluation tools to the ITQIP Coordinator to score and  
137 summarize.  
138

139 **CCHCs:** ECELS recruited 14 CCHCs for the project.  
140

141 The ITQIP Coordinator (a master's level nurse) has worked as a CCHC for more than 15 years.  
142 She and the project's Pediatrician Director educated, coached, mentored and supported the work  
143 of the CCHCs who were linked with the centers. She reviewed, completed and summarized the  
144 evaluation data. She sent the summary to the center director and the CCHC, before the first  
145 CCHC site visit. The CCHC compared her own observations with those documented in the  
146 summary. Next, the CCHC solicited concerns about health and safety practices from the center's  
147 staff. Collaboratively, the director, program staff and CCHC chose 3 topic areas with one or  
148 more *CFOC3* standards as the primary focus of improvement for each. The CCHC helped the  
149 staff prepare an Action Plan to work on their targeted 3 topic areas. Action Plans included filling  
150 gaps in knowledge, developing policies for staff and family handbooks and improving staff  
151 performance. The CCHCs made subsequent contacts and visits over the next 12-months.  
152

153 Quarterly, the CCHCs sent the ITQIP Coordinator documentation of their work and progress  
154 toward goals. The CCHCs submitted the center's initial Action Plan and a final Action Plan at  
155 the end of the year that showed what was completed in the center. The coordinator authorized  
156 payment of \$250 to the CCHCs after the CCHC submitted documentation that included the date  
157 of their visit to the center and the center's initial Action Plan. They received an additional  
158 \$250.00 after they submitted the final Action Plan from the 12-month linkage. Throughout the  
159 project, the ITQIP Coordinator reviewed CCHCs' encounter forms that described their work  
160 with the centers. She and the CCHCs discussed progress on Action Plans. She referred to or  
161 developed relevant health and safety resources to support the work the CCHC was doing with the  
162 linked center.  
163

### 164 **Evaluation Plan**

165 The ITQIP staff and consultants developed the evaluation tool described below. The ITQIP  
166 Project Coordinator and the evaluators used the evaluation tool to collect data from participating  
167 centers at three points: when centers enrolled in the study (Pre-test) and then a year and two  
168 years later, (Post-test1 and Post-test2). One of the two consultants (Richard Fiene, PhD)  
169 compared the two groups on the Pre-test for equivalency and then on each of the two post-tests.  
170 One year after the Pre-test data were collected, the participating centers were switched to a cross-  
171 over comparison data format. ITQIP ended the subsidy (but not necessarily the relationship) for  
172 the CCHCs that were working with the centers in the Immediate Intervention group and provided  
173 the subsidized CCHC linkage to the centers in the Delayed Intervention (Contrast) group.  
174

175 When a center enrolled in ITQIP, the ITQIP Coordinator interviewed the center director by  
176 phone. She gathered demographic data, obtained information about the number of I/T, the  
177 number of children who met the MCHB definition of special health needs, if the center had care  
178 plans for them, and where and when I/T activities occurred in the center. If there were care plans,

179 she asked the director to submit up to 5 care plans for review, redacted for confidentiality. (The  
180 MCHB definition of a child with special health care needs is noted in *CFOC3* standard 3.5.0.1  
181 as: “A child who has or is at increased risk for chronic physical, developmental, behavioral or  
182 emotional conditions and who requires health and related services of a type or amount beyond  
183 that required by children generally.”)

184

185 The evaluators recorded observations in one infant and one toddler room in each center. The  
186 ITQIP Coordinator selected the rooms with the largest number of children in the age group for  
187 the evaluator to observe.

188

189 The evaluator collected immunization records on site with the names redacted for confidentiality.  
190 The ITQIP Coordinator used WellCareTracker™ software to check a random sample of up to 10  
191 infants’ and 10 toddlers’ health records drawn by the evaluator from the files of participating  
192 centers. The ITQIP Coordinator evaluated the submitted care plans for the presence of the  
193 required 14 components specified in the *CFOC3* standard.

194

195 The ITQIP Coordinator scored the observations of diapering, hand hygiene, and medication  
196 administration. She promptly prepared a summary of all the findings from the center and shared  
197 the summary with the center director and the linked CCHC. The summary delineated areas of  
198 strengths and areas to improve based upon the evaluation tool results. To facilitate use of the data  
199 by the center and CCHC, the summary included the text of the evaluation tool item, the center’s  
200 score on the item and the reason why the center met or did not meet the standard. The CCHC  
201 contacted the center within 2 weeks of receiving the summary to set up the initial site visit.

202

### 203 **Evaluation Tool**

204 The ITQIP staff prepared the evaluation tool items from performance guidelines specified in the  
205 13 selected *CFOC3* standards. ITQIP consultants (Richard Fiene, PhD., Susan Aronson, MD,  
206 FAAP) as well as experienced CCHCs on the ECELS staff reviewed the tool for clarity and  
207 validity of content. After several rounds of revisions, the ITQIP staff and a prospective ITQIP  
208 evaluator field-tested the tool, further revised and then field-tested it again, this time testing for  
209 inter-rater reliability also.

210

211 The ITQIP evaluation tool had 4 sections: 1. Demographic Information collected in the phone  
212 interview, 2. Observation Items, 3. Interview items and 4. Documents: training records, written  
213 policies, care plans for children with special needs, immunization data and PA child abuse  
214 clearance documentation. Scoring for the items on the evaluation tool consisted of the possible  
215 responses below:

216

217 Table 2: Scoring Responses on the Evaluation Tool

218

219 A score of 2 or 3 was considered a strength and a score of 0 or 1 was considered an area to  
220 improve.

221

222 Each observation item, interview question and document reviewed was assigned to one of the 10  
223 topic areas that addressed the 13 selected *CFOC3* standards for ITQIP. (Table 2)

224



225 Table 3: Topic Areas

226

227 **RESULTS**

228

229 **Descriptive report**

230

231 The ITQIP grant provided CCHC linkages to 37 centers. These included the 32 originally  
232 recruited centers and five add-on centers that were recruited to stand-by anticipating that some  
233 centers might drop out of the program over the three-year project. In all, 59 directors, 348 I/T  
234 teachers and 1490 infants and toddlers were directly involved in ITQIP.

235

236 Over the one-year period of CCHC linkage, twelve of the 37 programs had 2 to 4 directors. This  
237 change in center leadership made the CCHC's work to improve I/T care very difficult. For the  
238 Immediate Intervention group, 3 of the original 16 centers withdrew from the project. One  
239 center in the Delayed Intervention (Contrast) group closed during the grant period and two others  
240 withdrew from the project. A few centers in both the Immediate Intervention and the Delayed  
241 Intervention (Contrast) groups were so overwhelmed with maintaining ratios in classrooms and  
242 staffing issues that their directors felt they couldn't focus on their Action Plans for health and  
243 safety improvement. Some of these dropped out.

244

245 This report compares pre-test and two post-test scores of the 13 Immediate Intervention sites and  
246 13 Delayed Intervention (Contrast) sites that remained enrolled in ITQIP for the full 3 years. It  
247 describes the similarities and differences between the two groups.

248

249 The evaluation plan is a classic randomly assigned clinical trial. See Figure 1 for the Evaluation  
250 Plan Logic Model.

251

252 **Figure 1: EVALUATION PLAN LOGIC MODEL**

253

254 The CCHCs in the Immediate Intervention group provided an average of 14 hours of  
255 consultation per site. The CCHCs in the Delayed Intervention (Contrast) group provided an  
256 average of 12.5 hours of consultation per site. The most common CCHC interactions with  
257 centers included: providing health education for the director and staff, on site consultation at the  
258 facility, technical assistance by phone or e-mail, providing print or audio-visual materials,  
259 helping the facility to comply with state regulations and developing health policies and  
260 procedures.

261

262 Topics targeted by the centers in the Immediate Intervention groups and the number of centers  
263 involved were: Safe Sleep Practices and SIDS Reduction Risk (11), Training of  
264 Caregivers/Teachers to Administer Medication (10), Child Abuse (6), Care Plans for Children  
265 with Special Needs (5), Diaper Changing Procedures (4), Limited Physical Activity of Infants (2)  
266 Hand Hygiene (2), and Immunizations (1). No center chose Personal Relationships or Active  
267 Opportunity for Physical Activity.

268

269 Topics targeted by centers in the Delayed Intervention (Contrast) group to improve were: Safe  
270 Sleep Practices and SIDS Reduction Risk (11), Care Plans for Children with Special Needs (8),

271 Training of Caregivers/Teachers to Administer Medication (6), Hand Hygiene (5), Diaper  
272 Changing Procedures (4), Active Opportunities for Physical Activity (4), Personal Relationships  
273 (1) and Limited Physical Activity of Infants (1). None chose Immunizations.  
274  
275

## 276 **Quantitative Comparison of Scores on the Pre-Test to the Two Post-Tests**

277

### 278 **Immediate Intervention Group**

279 On the pre-test, the range in scores was 175 to 267 with an average score of 212 out of a possible  
280 322 points (66%). On the first post-test, the range in scores was 213 to 297 with an average  
281 score of 254 out of a possible 322 points (79%). This change from pre-test to post-test was  
282 statistically significant ( $t = -4.62$ ;  $p < .0001$ ). The second post-test did not show any significant  
283 change from the average score on the first post-test, this demonstrates that the initial results from  
284 the intervention were maintained (254 to 254).  
285

### 286 **Delayed Intervention (Contrast) Group**

287 The range in scores was 164 to 271 with an average score of 218 out of a possible 322 points  
288 (68%) on the pre-test. On the first post-test, the range in scores was 149 to 257 with an average  
289 score of 221 out of a possible 322 points (69%). These changes from pre-test to post-test were  
290 not significant. The second post-test showed significant change in the average score from the  
291 first post-test (221 points) to the second post-test (243 points) ( $t = -1.80$ ;  $p < .08$ ) when this  
292 Delayed Intervention (Contrast) group had received the CCHC linkage.  
293

### 294 **Immediate Intervention versus Delayed Intervention (Contrast) Groups**

295 The comparison of the average scores between the Immediate Intervention (212) and Delayed  
296 Intervention (Contrast) (218) groups on the pre-test was not significant. The difference between  
297 the average scores of the Immediate Intervention (254) and Delayed Intervention (Contrast)  
298 (221) groups on the first-year Post-test was statistically significant ( $t = -3.46$ ;  $p < .002$ ). The  
299 second-year Post test showed no significant difference between the change in the average post-  
300 intervention scores for the Immediate Intervention group and the Delayed Intervention (Contrast)  
301 group (254 vs 243).  
302

303 See Figure 2 for the Crossover Comparison Results.  
304

## 305 **Figure 2: Crossover Comparison Results**

306

307 The above graph depicts the relationship between the Immediate Intervention and the Delayed  
308 Intervention (Contrast) groups in a Crossover design. It clearly demonstrates how effective the  
309 intervention (Pre-test to Post-test1) was for the Immediate Intervention group and that the effects  
310 were persistent (Post-test1 to Post-test2). It also shows that the intervention was effective when  
311 the Delayed Intervention (Contrast) group was switched to receive the CCHC intervention with  
312 targeted training, technical assistance and collaborative consultation a year after their pre-test  
313 assessment. (Post-test1 to Post-test2).  
314

315 **For the Immediate Intervention Group, after one year of linkage with a CCHC**

316 Statistically significant improvement (Pre-test to Post-Test 1) was documented for the following  
317 evaluation tool items:

318

319 Medication Administration: The number of staff the director said were authorized to give  
320 medications to infants and toddlers and for whom the director has documentation that these  
321 individuals have received training within the year from a health professional about how to give  
322 medication.

323

324 Safe Sleep: The number of written safe sleep policies in centers, and the number of teachers and  
325 parents who reviewed the safe sleep policies and who were educated about safe sleep practices.

326

327 Child Abuse: The number of both infant and toddler teachers educated about child abuse and  
328 how, as mandated reporters, they are required to personally report incidents they suspect might  
329 involve child maltreatment. An increase in the number of centers having required clearance  
330 documents on file for teachers.

331

332 Active Opportunities for Physical Activity: Infants (birth to twelve months of age) were taken  
333 outside two to three times per day, as tolerated. Toddlers (twelve months to three years) and  
334 preschoolers (three to six years) were allowed sixty to ninety total minutes of outdoor play.  
335 These outdoor times could be curtailed somewhat during adverse weather conditions in which  
336 children may still play safely outdoors for shorter periods, with an increase in the time of indoor  
337 activity, so the total amount of exercise remained the same. The total time allotted for moderate  
338 to vigorous activities for toddlers was 60 to 90 minutes per eight-hour day for moderate to  
339 vigorous physical activity.

340

341 Diaper Changing: Prior to the beginning of the change, changing table paper was placed over  
342 the diapering surface, followed by the gathering of supplies needed for the change from the  
343 containers in which they are stored, and use of gloves.

344

345 Hand Hygiene: Only 2 centers chose to work with their CCHC on improving hand hygiene in the  
346 Immediate Intervention group. Times that toddlers and caregivers should have their hands  
347 washed showed statistically significant improvement after CCHC linkage, but there was no  
348 similar improvement noted for infants and their caregivers.

349

350 One center creatively urged parents to wash the hands of their infants and toddlers upon arrival  
351 each day with posters that suggested hand washing would avoid needing to take a vacation day  
352 or a sick day.

353

354 **The statistically significant changes in evaluation tool items noted for the Delayed**  
355 **Intervention (Contrast) Group comparison of Post-Test1 compared to Post-Test2 after**  
356 **their one year of linkage with a CCHC included:**

357

358 Safe Sleep: The number of safe sleep policies that contained all the elements that should be in a  
359 safe sleep policy per *CFOC3* standard 3.1.4.1.; documentation that parents reviewed the center  
360 safe sleep policy and were educated about safe sleep practices; removal of soft or loose bedding  
361 or other objects from a crib when an infant was in the crib and caregivers and teachers checking

362 on sleeping infants often enough (about every 5 minutes) to be sure that the infant was still  
363 breathing.

364

365 The director of one center advocated for corporate-wide use of the safe sleep policy developed  
366 with help of the center's CCHC. This center is part of a corporation providing child care in 12  
367 states. Thus, the development of this center's safe sleep policy could have far reaching  
368 implications.

369

370 Medication Administration: Verification of the name of a child when medication is to be  
371 administered to that child.

372

373 Diaper Changing: the practice of bottom clothing being removed, including shoes and socks, if  
374 feet cannot be kept from contacting soiled skin or surfaces or if clothing is soiled, it is removed  
375 and placed in a plastic bag.

376

377 Special Needs: Improvement in the number of care plans submitted that included the required  
378 elements in a care plan for children with special needs per the *CFOC3* standard 3.5.0.1.

379

380 **After one year of linkage with a CCHC, statistically significant improvement (Pre-test to  
381 Post-Test 1) did not occur for the following topics:**

382

383 Immunization: Working with a CCHC was not directly associated with an increase in the  
384 percentage of I/T sampled center records that documented that the children were up to date on  
385 their vaccines. Only 1 of the 13 Immediate Intervention centers chose to work on immunization  
386 status as an action planning item. The ITQIP staff checked immunization records using the  
387 online application, WellCareTracker™. On the Pre-test, the Immediate Intervention centers,  
388 22% of the immunization records for infants and 43% of the immunization records for toddlers  
389 were up to date. In the Delayed Intervention (Contrast) centers, 25% of the immunization records  
390 for infants and 40% of the immunizations records for toddlers were up to date. One year after  
391 working with a CCHC, the Immediate Intervention centers showed an improved percentage  
392 (36%) of the records, The Delayed Intervention (Contrast) centers also improved with 38% of  
393 the records for infants showing up-to-date vaccines. In Post-test2, the up-to-date immunization  
394 records for toddlers for the Immediate Intervention centers remained unchanged at 43% and  
395 documentation of up-to-date toddler immunization dropped to 27% in the Delayed Intervention  
396 (Contrast) centers.

397

398 Care Plans for Children with Special Needs: Although this topic was not associated with a  
399 statistically significant improvement for the Immediate Intervention centers, there was a  
400 statistically significant improvement for the Delayed Intervention centers after Post-test2.

401

402 Combining the Immediate Intervention and Delayed Intervention (Contrast) centers findings for  
403 this topic, the Pre-test revealed 66 I/T identified with special health care needs in the 32 centers  
404 that entered ITQIP. Only 15 (23%) of I/T with identified special health care needs had any Care  
405 Plan signed by a health care professional. Only 1 of 66 I/T with special health care needs had a  
406 care plan signed by a health care professional that had all necessary components for optimal  
407 daily and/or emergency care. Post-test2 revealed 39 I/T identified with a special health care need

408 in the remaining 26 centers. Fifteen (38%) of the I/T with identified special health care needs had  
409 a care plan signed by a health professional. Four of the 15 care plans had all the required  
410 elements. Sixty-two percent of children identified by the centers as having a special health care  
411 need did not have a Care Plan at all. Examples of children who had special needs and had no care  
412 plan signed by a health care provider included children with: gastro-esophageal reflux taking  
413 Zantac, a history of febrile seizures, asthma, multiple epi-pens on site, but no care plans  
414 describing what they were needed for, autism, non-febrile seizures, torticollis and plagiocephaly,  
415 requiring a helmet be worn each day.

416

## 417 **DISCUSSION AND CONCLUSIONS**

418

419 Improvements in practice specified in selected *CFOC3* standards occurred. Many of the directors  
420 said they appreciated the help they received from the CCHCs that ITQIP linked with their  
421 centers. The centers that participated in this project were STAR 2 and STAR 3 programs that  
422 wanted to improve and were willing to contribute their time and a modest co-payment to work  
423 with a CCHC. This selection bias may have fostered the observed improvements.

424

425 Collaboration among families, child care providers and health care professionals is required for  
426 provision of competent high quality care. This is especially true for inclusion of children with  
427 health care needs into child care programs. CCHCs reported that they were most successful at  
428 helping the centers have complete, useful care plans for children with disease-specific  
429 conditions.

430

431 No requirement for a specific time spent in the CCHC role for each linkage was imposed. The  
432 range of time reported by the CCHCs during ITQIP was from 2 hours (2 Centers) for linkages  
433 that were not implemented, to 20 to 32 hours (7 Centers). None of the centers in this project  
434 continued their relationship with their CCHC after the year of subsidized linkage. Some said they  
435 would continue the CCHC on a fee basis if they could budget for it in the future. The linkage of a  
436 CCHC improves health and safety performance. It should be required and financed.

437

438

439

## References

440

441

442 Alkon A, & Bernzweig, J. (2008). Child Care Health Linkages Project Evaluation Summary.

443 California Childcare Health Program, UCSF School of Nursing, September 2001 – June  
444 2004. Retrieved from

445 [http://www.ucsfchildcarehealth.org/pdfs/training\\_etc/Linkages\\_ExecSummary\\_FINAL.p](http://www.ucsfchildcarehealth.org/pdfs/training_etc/Linkages_ExecSummary_FINAL.pdf)  
446 [df](http://www.ucsfchildcarehealth.org/pdfs/training_etc/Linkages_ExecSummary_FINAL.pdf)

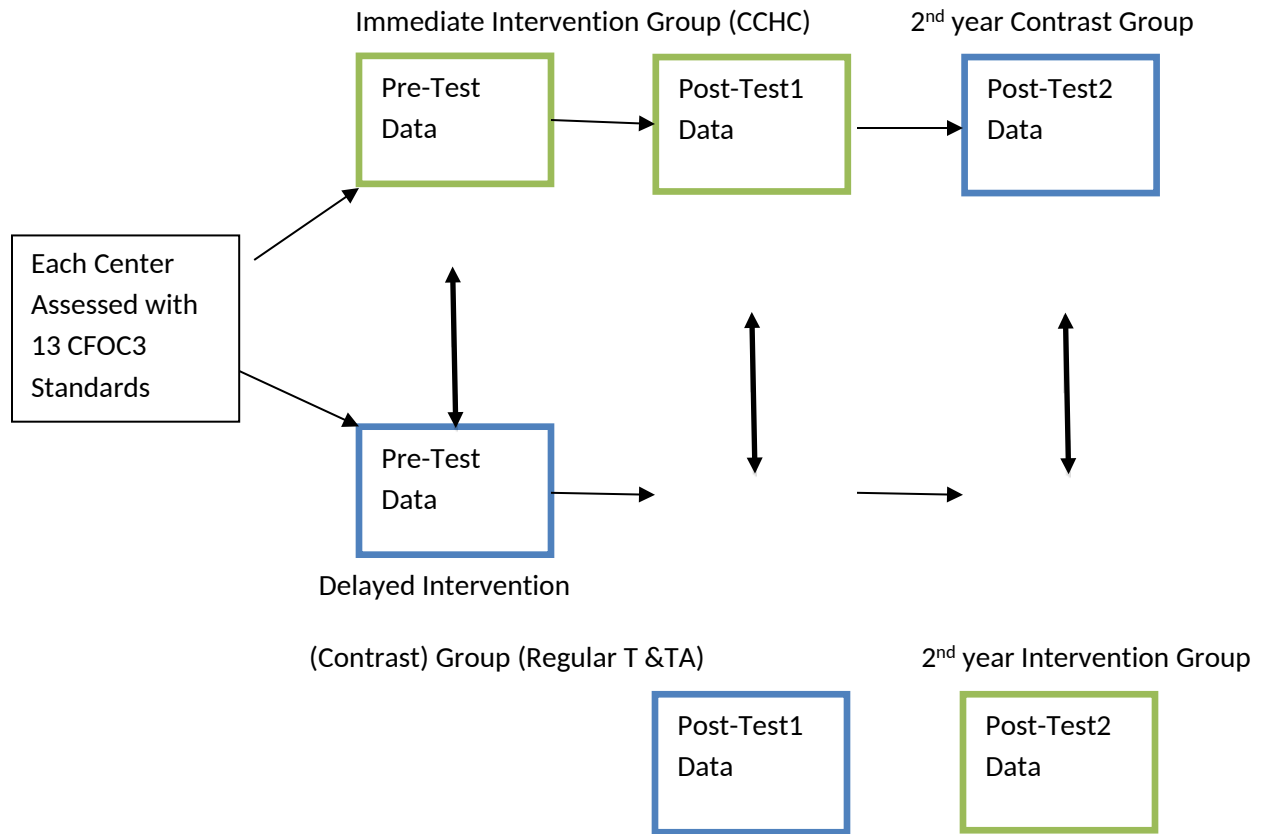
447 Alkon, A., Bernzweig, J., Kim, T., Mackie, J., Wolff, M., & Elman, J. (2008) Child Care Health  
448 Consultation Programs in California: Models, Services, and Facilitators. *Public Health*  
449 *Nursing*, 25 (2), 126-139. DOI: 10.1111/j.1525-1446.2008.00689.x

450 Alkon, A., Bernzweig, J., Kim, T., Wolff, M., & Mackie, J. (2009). Child care health  
451 consultation improves health and safety policies and practices. *Academic Pediatrics*, 9  
452 (5), 366–370.

- 453 Alkon, A., Crowley, A., Benjamin Neelon, S., Hill, S., Pan, Y., Nguyen, V., Kotch, J.B. (2014).  
 454 Nutrition and physical activity randomized control trial in child care centers improves  
 455 knowledge, policies, and children's body mass index. *BMC Public Health*, 14, 215.  
 456 DOI: 10.1186/1471-2458-14-215. Retrieved from BioMed Central website:  
 457 <http://www.biomedcentral.com/1471-2458/14/215>
- 458 Alkon, A, Nouredini, S., Swartz, A., Sutherland, A.M., Stephens, M., Davidson, N., & Rose, R.  
 459 (2016). Management Intervention in Child Care Centers Improves Knowledge, Pest  
 460 Control, and Practices. *Journal of Pediatric Health Care (in press)*  
 461 <http://dx.doi.org/10.1016/j.pedhc.2016.07.004>
- 462 Alkon, A., Sokal-Gutierrez, K., & Wolff, M. (2002). Child care health consultation improves  
 463 health knowledge and compliance. *Pediatric Nursing*, 28 (1), 61-65.
- 464 American Academy of Pediatrics, American Public Health Association, National Resource  
 465 Center for Health and Safety in Child Care and Early Education. 2011. *Caring for Our*  
 466 *Children: National Health and Safety Performance Standards; Guidelines for Early*  
 467 *Care and Education Programs (3<sup>rd</sup> ed.)*. Elk Grove Village, IL: American Academy of  
 468 Pediatrics; Washington DC: American Public Health Association.
- 469 Aronson, S. (Ed). (2012). *Healthy Young Children (5<sup>th</sup> ed.)*. Washington D.C.: The National  
 470 Association for the Education of Young Children.
- 471 Aronson, S. (Ed). (2014). *Model Child Care Health Policies (5<sup>th</sup> ed.)* PA Chapter American  
 472 Academy of Pediatrics. Elk Grove, Ill.: American Academy of Pediatrics. Website:  
 473 Aronson, S and Shope, T. (Eds.) (2016). *Managing Infectious Diseases in Child Care and*  
 474 *Schools, A Quick Reference Guide (4<sup>th</sup> ed.)*. East Grove Village, Ill.: The American  
 475 Academy of Pediatrics.  
 476 <http://www.ecels-healthychildcarepa.org>
- 477 Banghart, P., & Kraeder, J.P., (2012, March). What Can CCDF Learn from the Research on  
 478 Children's Health and Safety in Child Care? *Urban Institute Brief #03*. Retrieved from  
 479 Urban Institute website: <http://www.urban.org/publications/412579.html>
- 480 Carabin, H., Gyorkos, T., Soto, J., Joseph, L., Payment, P., Collet, J.P. (1999).  
 481 Effectiveness of a Training Program in Reducing Infections in Toddlers Attending Day  
 482 Care Centers. *Epidemiology*, 10 (3), 219-227.
- 483 Cole, PS. (2008). Child Care Health Consultation Improves Health and Safety Practices and  
 484 Environments in Early Education Settings. Indiana Institute on Disability and  
 485 Community.
- 486 Crowley A. (2006) Improving Child and Family Health through Child Care Health Consultation.  
 487 Executive Summary. Beatrice Renfield-Yale School of Nursing Clinical Research  
 488 Initiatives Fund. Yale University School of Nursing.
- 489 Fiene, R. (2002). Thirteen Indicators of Quality Child Care: Research Update. Washington,  
 490 D.C.: Health Resources and Services Administration/Maternal and Child Health Bureau,  
 491 U.S. Department of Health and Human Services and the Office of the Assistant Secretary  
 492 for Planning and Evaluation.
- 493 Harms, T., Cryer, D., Clifford, R., (2006). Infant/Toddler Environmental Rating Scale, Revised  
 494 Edition, Frank Porter Graham Child Development Institute, the University of North  
 495 Carolina at Chapel Hill. New York: Teachers College Press.
- 496 Isbell, P., Kotch, J., Savage, E., Gunn, E., Lu, L., & Weber, D. (2013). Improvement of child  
 497 care programs' policies, practices, and children's access to health care linked to child  
 498 care health consultation. *NHSA Dialog: A Research to Practice Journal*, 16(2), 34-52

- 499 Kotch, J. B. (2002). *The Quality Enhancement Project for Infants and Toddlers: Executive*  
500 *Summary*. Chapel Hill, NC: University of North Carolina at Chapel Hill.
- 501 Kotch, J. B., Isbell, P., Weber, D. J., Nguyen, V., Savage, E., Gunn, E., et al. (2007). Hand-  
502 washing and diapering equipment reduces disease among children in out-of-home child  
503 care centers. *Pediatrics*, 120, e29–e36.
- 504 Moon R & Oden R. (2005) Back to Sleep: Can We Influence Child Care Providers. *Pediatrics*,  
505 112 (4), 878-882.
- 506 Organizational Research Services and Geo Education & Research, (2007, March) Child Care  
507 Health Consultation: Evidence Based Effectiveness. Data from Healthy Child Care  
508 Washington Evaluation Report 2003-2007. Washington State Department of Health,  
509 2007, 29. Seattle Washington.  
510 Retrieved from  
511 [https://www.napnap.org/sites/default/files/userfiles/membership/CCS\\_SIG\\_Evide](https://www.napnap.org/sites/default/files/userfiles/membership/CCS_SIG_Evidence_20Based_20CCHP.pdf)  
512 [nce\\_20Based\\_20CCHP.pdf](https://www.napnap.org/sites/default/files/userfiles/membership/CCS_SIG_Evidence_20Based_20CCHP.pdf)
- 513 Pennsylvania Office of Child Development and Early Learning. (2010) *Demonstrating Quality:*  
514 *Pennsylvania Keystone STARS 2010 Program Report*. Retrieved from  
515 [http://www.ocdelresearch.org/Reports/Forms/AllItems.aspx?RootFolder=%2FReports%2](http://www.ocdelresearch.org/Reports/Forms/AllItems.aspx?RootFolder=%2FReports%2FKeystone%20STARS&FolderCTID=0x01200092EA27E29EEE3E4AAE2D4C5508AC9E5A&View={5EEC6855-F8A8-486E-B6E0-FE6B9FDEBE2E})  
516 [FKeystone%20STARS&FolderCTID=0x01200092EA27E29EEE3E4AAE2D4C5508AC](http://www.ocdelresearch.org/Reports/Forms/AllItems.aspx?RootFolder=%2FReports%2FKeystone%20STARS&FolderCTID=0x01200092EA27E29EEE3E4AAE2D4C5508AC9E5A&View={5EEC6855-F8A8-486E-B6E0-FE6B9FDEBE2E})  
517 [9E5A&View={5EEC6855-F8A8-486E-B6E0-FE6B9FDEBE2E}](http://www.ocdelresearch.org/Reports/Forms/AllItems.aspx?RootFolder=%2FReports%2FKeystone%20STARS&FolderCTID=0x01200092EA27E29EEE3E4AAE2D4C5508AC9E5A&View={5EEC6855-F8A8-486E-B6E0-FE6B9FDEBE2E})
- 518 Pennsylvania Key – Program Quality Assessment Team (2016). 2015-2016 Environmental  
519 Rating Scale Reports: ECERS-R, ECERS-3, ITERS-R.
- 520 Pacific Research and Evaluation, (2008). *Improving the health and safety of children in*  
521 *Oregon’s child care: Implementation and outcomes of Oregon Child Care Health*  
522 *Consultation Program*. Department of Human Services, Public Health Division, Office  
523 of Family Health, Portland, Oregon
- 524 Pacific Research and Evaluation, (2007). *Evaluation of the Child Care Health Consultation*  
525 *Demonstration Program: Phase IV Final Report 2007*. Department of Human Services,  
526 Office of Family Health, Portland, Oregon.
- 527 Ramler, M., Nakatsukasa-Ono, W., Loe, C., & Harris, K. (2006, August). The influence of child  
528 care health consultants in promoting children’s health and well-being: A report on  
529 selected resources. United States: Maternal Child Health Bureau, August 2006.  
530 Education Development Center, Inc. Healthy Child Care Consultant Network Support  
531 Center, Newton, MA and CHT Resource Group, Oakland, CA.
- 532 Roberts, L., Smith, W., Jorm, L., Patel, M., Douglas, R.M., & McGilchrist, C. (2000). Effect of  
533 Infection Control Measures on the Frequency of Upper Respiratory Infection in Child  
534 Care: A Randomized, Controlled Study. *Pediatrics*, 105(4), 738-742.
- 535 Roberts, L., Smith, W., Jorm, L., Patel, M., Douglas, R.M., & McGilchrist, C. (2000). Effect of  
536 Infection Control Measures on the Frequency of Diarrheal Episodes in Child Care: A  
537 Randomized, Controlled Study. *Pediatrics*, 105(4), 743-746.
- 538 Zaslow M., Tout K., & Halle T. *On-Site Approaches to Quality Improvement in Quality Rating*  
539 *and Improvement Systems: Building on the Research on Coaching*, Research-to-Policy,  
540 Research-to-Practice Brief OPRE 2012-40. Washington, DC: Office of Planning,  
541 Research and Evaluation, Administration for Children and Families, U.S. Department of  
542 Health and Human Services)
- 543
- 544

**Figure 1: EVALUATION PLAN LOGIC MODEL**





**Figure 2: Crossover Comparison Results**

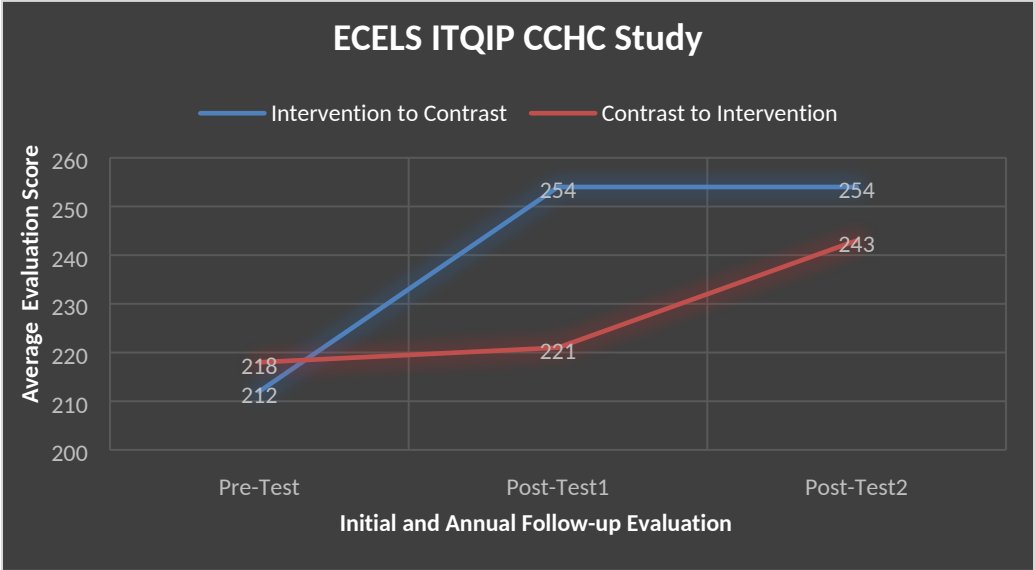


Table 1: *CFOC3* Standards Chosen for ITQIP

- 1.4.5.2 - Child Abuse and Neglect Education
- 3.4.4.1 - Recognizing and Reporting Suspected Child Abuse, Neglect, and Exploitation
- 2.1.2.1 - Personal Caregiver/Teacher Relationships for Infants and Toddlers
- 2.2.0.2 - Limiting Infant/Toddler Time in Crib, High Chair, Car Seat, and other restraining equipment
- 3.1.3.1 - Active Opportunities for Physical Activity
- 3.1.4.1 - Safe Sleep Practices and SIDS Risk Reduction
- 3.2.1.4 – Diaper Changing Procedure
- 3.2.2.1 – Situations that Require Hand Hygiene
- 3.2.2.2 – Handwashing Procedure
- 3.6.3.3 - Training of Caregivers/Teachers to Administer Medication
- 3.5.0.1 - Care Plan for Children with Special Health Care Needs
- 5.4.5.2 - Cribs
- 7.2.0.1 - Immunization Documentation

Table 2: Scoring Responses on the Evaluation Tool

0: Never meets item

1: Partly (<50%) meets item

2: Mostly (= or >50%) meets item

3: Fully (100%) meets the item

NA: Not Applicable

NOp: Not Observed or No Opportunity to obtain data

DK: Don't Know (interviewee response)

Table 3: Topic Areas:

CA = Child Abuse

PR = Personal Relationships

AO = Active Opportunities for Physical Activity

LA= Limited Physical Activity of Infants

SS = Safe Sleep Practices and SIDS Risk Reduction

MA = Training of Caregivers/Teachers to Administer Medication

DC = Diaper Changing Procedure (includes changing soiled underwear/training pants)

HH = Hand Hygiene

SN = Care Plan for Children with Special Needs

IM = Immunization Documentation

*Caring for Our Children* Health and Safety Standards into Child Care Practice: Child Care Health Consultation Improves Infant and Toddler Care

Rosemary Johnston, RN, BSN, MSN  
Infant Toddler Quality Improvement Project Coordinator  
PA Chapter, American Academy of Pediatrics  
Early Childhood Education Linkage System (ECELS)  
1400 North Providence Road, Suite 3007  
Rose Tree Corporate Center II  
Media, PA 19063  
[rljrmj@msn.com](mailto:rljrmj@msn.com)  
484/446-3003

Beth DelConte, MD, FAAP  
Pediatric Advisor  
PA Chapter, American Academy of Pediatrics  
Early Childhood Education Linkage System (ECELS)

Libby Ungvary, MEd  
Director  
PA Chapter, American Academy of Pediatrics  
Early Childhood Education Linkage System (ECELS)  
[lungvary@paaap.org](mailto:lungvary@paaap.org)  
484/446-3077

Richard Fiene, PhD  
Director, Research Institute for Key Indicators  
<http://pennstate.academia.edu/RickFiene>

Susan S. Aronson, MD, FAAP  
Pediatric Advisor  
PA Chapter, American Academy of Pediatrics  
Early Childhood Education Linkage System (ECELS)  
Retired Clinical Professor of Pediatrics, the University of Pennsylvania,  
The Children's Hospital of Philadelphia  
[saronson@aap.net](mailto:saronson@aap.net)

Disclosures: the authors have no disclosures to report

Key Words: child care, child care health consultation, health and safety, infants and toddlers