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

The Pennsylvania Chapter of the American Academy of Pediatrics (PA AAP) recruited 37 infant-toddler (I/T) child care centers to participate in a health and safety quality improvement initiative. The centers were assigned alternately to an Immediate Intervention or a one-year Delayed Intervention (Contrast) group. The intervention involved linkage of the center with a Child Care Health Consultant (CCHC). Project staff selected 13 standards from a list provided by the Maternal and Child Health Bureau (MCHB) from Caring for Our Children: National Health and Safety Performance Standard; Guidelines for Early Care and Education Programs 3rd ed. (CFOC3) An independent evaluator assessed performance of the 13 standards in the participating centers at project entry, 1 year and 2 years later. Each center chose 3 health and safety topics and the corresponding CFOC3 standards to work on with their CCHC. In the second year, in a cross-over comparison, each of the Contrast centers was linked with a CCHC. The results demonstrated that working with a CCHC effectively improved performance of selected health and safety standards.

INTRODUCTION

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

The aims of the I/T Quality Improvement Project [ITQIP] were to (1) assess child care center practices related to I/T care as defined in 13 selected CFOC3 standards, (2) assess whether compliance with these practices improves when centers were linked with a CCHC. (3) advocate for adoption of CFOC3 standards for I/T practices in Pennsylvania’s QRIS, Keystone STARS.

Child care programs in Keystone STARS earn ratings from lowest, Star 1 to highest, Star 4. To earn a STAR rating, programs must comply with state regulations and meet additional requirements for the designated STAR level listed on the PA Key website, www.pakeys.org. For a STAR 4 rating, a center must have scores at or above “good” on the 7 subscales of the Infant and Toddler Environment Rating Scale-Revised Edition [ITERS –R] (Harms, Cryer, & Clifford, 2006). Some health and safety items are in the Personal Care Routine sub-scale of ITERS-R. Scores in this subscale and on health and safety items in some of the other subscales are among the lowest scoring ITERS-R items reported by the authors of ITERS-R (Personal communication...
by Harms and Cryer to S. Aronson) and recorded by the *Pennsylvania Key – Program Quality Assessment Team* (Pennsylvania Key, 2016).

In 1995, federal grants were offered to states to implement Healthy Child Care America [HCCA] projects. A National Training Institute [NTI] for CCHC trainers was established at the University of North Carolina at Chapel Hill to help states create a cohort of CCHCs and to provide continuing support for CCHCs. After more than a decade of federal funding, MCHB converted targeted grants to states for HCCA activities to Early Childhood Comprehensive Systems [ECCS] grants. While states were encouraged to continue successful HCCA activities, they could choose to use the funds for other initiatives. HCCA initiatives withered. Most of the funding for CCHCs was diverted to other activities at the state level. In 2013 funding for the NTI was not renewed.

CCHCs use observation, education, collaborative decision-making, coaching and mentoring to achieve quality improvement in the QRIS (Zaslow, Tout & Halle, 2012). CCHCs base their work on identified needs, and feasible implementation. Published research studies over more than a decade confirmed child care health consultation as an evidence–based, effective quality improvement approach. (Alkon & Bernzweig, 2008; Alkon et al. 2008; Alkon, Bernzweig, Kim, Wolff, & Mackie, 2009; Alkon et al, 2014, Alkon et al. 2016; Alkon, Sokal-Gutierrez & Wolf, 2002; Banghart & Kraeder, 2012; Carabin et al, 1999; Cole, 2008; Crowley, 2006; Isabell et al 2013; Moon & Oden, 2005; Organizational Research Services & Geo Education& Research, 2007; Pacific Research & Evaluation, 2007; Ramlr, Nakatsukasa-Ono, Loe & Harris, 2006; Roberts et al, 2000a; Roberts et al, 2000b) These studies measured the impact of linking child care centers with CCHCs who provided professional development (training), consultation and technical assistance. Documented improvements associated with involvement of a CCHC included many key aspects of quality I/T care. Improved sanitation and hygiene reduced respiratory and gastrointestinal illness and days absent for illness among young children in group care (Carabin et al, 1999; Kotch et al, 2007; Roberts et al, 2000a; Roberts et al, 2000b). Practices related to active play, nutrition and food handling improved (Alkon et al, 2014). Education and adoption of policies and procedures to reduce hazards resulted in fewer injuries (Kotch, 2002; Organizational Research Services and Geo Education & Research, 2007). Training about safe infant sleep positioning and the infant sleep environment was associated with reduced risk of Sudden Infant Death Syndrome (Moon & Oden, 2005; Cole, 2008). Help from CCHCs to monitor and track immunization data in child care programs resulted in more children having up-to-date vaccine documentation (Alkon & Bernzweig, 2008).

ECELS was established as a program of the PA AAP in 1989. It was cited as a model for the federally funded HCCA programs in 1995. From its earliest days, ECELS has recruited and prepared health professionals to serve as CCHCs. In Pennsylvania, CCHCs are private and public health service providers and academics. ECELS maintains a Child Care Health Consultant Registry and regularly communicates with registered CCHCs to provide professional development, technical assistance and tools to enable their implementation of the CCHC role.

Child care program budgets are strained by efforts to pay teachers/caregivers a living wage and provide benefits. Adding a modest honorarium to their budgets for a CCHC is not a high priority for them. Pennsylvania neither requires nor supports a sufficient cohort of seasoned CCHCs to
make routine CCHC linkages possible. Due to unpredictable funding for CCHC work, most CCHCs have other health professional roles.

ECELS staff have contributed to or directly developed several nationally popular publications to aid in the implementation of CFOC3. These publications include, *Healthy Young Children, 5th ed.* (Aronson, 2012), *Managing Infectious Diseases in Child Care and Schools, A Quick Reference Guide, 4th ed.* (Aronson & Shope, 2016) and *Model Child Care Health Policies, 5th ed.* (Aronson, 2014). They are available from the National Association for the Education of Young Children and/or the AAP.

The ECELS website, [www.ecels-healthychildcarepa.org](http://www.ecels-healthychildcarepa.org), offers more than 2 dozen online learning modules, including media-rich, interactive lessons. In addition, ECELS provides lesson plans to qualified instructors to use for in-person workshops. ECELS is authorized to approve credit in the PA professional development registry for use of content maintained by ECELS.

ECELS encourages child care centers that serve 25 or more children to use a well-tested online software application called WellCareTracker™. It is described, demonstrated and offered for subscription at [www.wellcaretracker.org](http://www.wellcaretracker.org). Using the online software eases the burden on child care providers to comply with Pennsylvania’s regulatory requirement to document that enrolled children are up to date with preventive health services recommended by the AAP. A pediatrician, Stuart Weinberg, MD maintains the system and updates the algorithms whenever the nationally recommendations change.

### METHODOLOGY

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

The MCHB Funding Opportunities Announcement specified a list of CFOC3 standards from which grantees were to select 10 or more standards to address in their proposed projects. To select the standards, ECELS asked for input from the group of early childhood stakeholders that the state convened to work on quality improvement in Keystone STARS. They prioritized the standards using the following criteria: a) the associated with the highest and most common risks of harm to I/T, b) measurable and amenable to improvement as a result of technical assistance and professional development provided by a CCHC over a 12-month period, and c) those that state data showed high levels of non-compliance with the standard. Using this input, ECELS chose 13 standards (Table 1) correlated with 10 topics areas. (Table 2). Once chosen, the ITQIP staff used these standards to develop an evaluation tool.

#### 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, & 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

Recruitment of centers, and roles of center staff, evaluators and CCHCs

Centers: ECELS recruited Keystone STAR 2 and STAR 3 centers to participate in ITQIP. These programs wanted to improve to reach STAR 4, the highest quality recognition. Programs with higher STARS levels qualify for higher payments for enrolled children whose care is state subsidized.

ECELS recruited centers on a rolling basis. As the centers joined ITQIP, the ITQIP Coordinator assigned them alternately to one of the two groups, either the Immediate Intervention Group or the Delayed Intervention (Contrast) group. ITQIP enrolled centers from all but one of the 5 Keystone STARS state regions; the Northwest region had no recruited centers.

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

The enrolled centers agreed to the following:  
- allow a 4-5-hour site evaluation once a year for 3 years  
- work with a CCHC for a period of one year to improve I/T health and safety  
- accept random assignment to the Immediate Intervention or Delayed Intervention (Contrast) group  
- provide privacy protected (redacted) access to immunization and care plan data for evaluation  
- pay $240.00 contribution to the $500 honorarium ITQIP paid to their CCHC  
- remain in ITQIP for 3 years.

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

The evaluators gave their completed evaluation tools to the ITQIP Coordinator.

CCHCs: ECELS recruited 14 CCHCs from the ECELS Child Care Health Consultant Registry and interested health professionals from community health care programs, training institutions
and the Maternal Infant Early Childhood Home Visiting Program (MIECHV). Seven MIECHV nurses were interested in becoming a CCHC. ECELS recruited, trained and mentored one MIECHV nurse to work as a CCHC in the project and recruited, trained and mentored 2 MIECHV nurses to be evaluators. One MIECHV nurse was interested but no center was recruited near enough to her.

CCHC experience ranged from highly experienced, to being new in the CCHC role. The ITQIP Coordinator (a master’s level nurse) has worked as a CCHC for more than 15 years. She coached/mentored and supported the work of the CCHCs who were linked with the centers. The ITQIP Director and ITQIP Coordinator gathered resources relevant to I/T care and distributed them to the CCHCs before they were linked with their centers.

The CCHC made an initial site visit to meet staff members at the linked center and directly observed the center’s practices related to the 13 selected standards. The CCHC compared these observations with the ITQIP Coordinator’s most recent summary of data the evaluator had recorded on the evaluation tool. Next, the CCHC solicited concerns about health and safety practices from the center’s staff. Collaboratively, the director, program staff and CCHC chose 3 topic areas with one or more CFOC3 standards as the primary focus of improvement for each. The CCHC helped the staff prepare an Action Plan to meet the 3 topic areas they wanted to target over their year of linkage. Action Plans included filling gaps in knowledge, developing policies for staff and family handbooks and improving staff performance. The CCHCs made subsequent visits and contacts as needed over the next 12-months.

**ITQIP Coordinator**

The ITQIP Coordinator worked under the supervision of the ITQIP Director, a pediatrician (the ITQIP Principal Investigator). Quarterly, the ITQIP Coordinator reviewed CCHCs’ encounter forms that described their work with the centers. She and the CCHCs discussed progress on Action Plans. She referred to or developed relevant health and safety resources to support the work the CCHC was doing with the linked center. For example, she suggested using:

- Pennsylvania-specific resources on an “Infant-Toddler Physical Activity Resource List”
- “Building a Healthy Start,” a DVD/CD module developed by the Alabama Department of Public Health that addresses nutrition and the promotion of I/T physical activity
- Tools to help centers obtain and use care plans at enrollment to provide competent care of children with special health care needs: a flow chart, “Process to Support Enrollment of a Child with Special Needs,” and a “Care Plan Checklist for Children with Special Needs” to be sure the staff have necessary training and provide appropriate accommodations.
- A diapering poster, free to download from the ECELS website at [www.ecels-healthychildcarepa.org](http://www.ecels-healthychildcarepa.org). This poster relies more on illustrations than words.

Quarterly, the CCHCs sent the ITQIP Coordinator documentation of their work and progress toward goals. The CCHCs submitted the center’s initial Action Plan and a final Action Plan at the end of the year that showed what was completed in the center. The CCHCs received $250.00 after they submitted documentation that included the date of their visit to the center and the center’s initial Action Plan. They received an additional $250.00 after they submitted the final Action Plan from the 12-month linkage.
Evaluation Plan
The ITQIP staff and consultants developed an evaluation tool as described below. The ITQIP Project Coordinator and the evaluators used the evaluation tool to collect data from participating centers at three points: when centers enrolled in the study (Pre-test) and then a year and two years later, (Post-test1 and Post-test2). One of the two consultants (Richard Fiene, PhD) compared the two groups on the Pre-test for equivalency and then on each of the two post-tests. One year after the Pre-test data were collected, the participating centers were switched to a cross-over comparison data format. The centers in the Immediate Intervention group ended their subsidized linkage with the CCHC and the centers in the Delayed Intervention (Contrast) group received the CCHC linkage.

After a center enrolled in ITQIP, the ITQIP Coordinator interviewed the center director by phone. In this interview, she gathered demographic data, obtained information about the number of I/T, where and when the I/T activities occurred in the center. She used this information to select the classrooms for the evaluator to observe. She gave the activity schedule to the evaluators so they could plan when to make their observations.

Two parts of the evaluation required direct assessment of data by the ITQIP Coordinator; immunization records and the content of the care plans for children with special needs. The evaluator collected immunization records on site with the names redacted for confidentiality. The ITQIP Coordinator used WellCareTracker™ software to check a random sample of up to 10 infants’ and 10 toddlers’ health records drawn by the evaluator from the files of participating centers.

The phone interview also included how many I/T were enrolled at that center who met the MCHB definition of special health needs and whether the center had care plans for them. If there were care plans, she asked the director to send her up to 5 care plans for review, redacted for confidentiality. (The MCHB definition of a child with special health care needs is noted in CFOC3 standard 3.5.0.1 as: “A child who has or is at increased risk for chronic physical, developmental, behavioral or emotional conditions and who requires health and related services of a type or amount beyond that required by children generally.”) The ITQIP Coordinator evaluated the submitted care plans for the presence of the required 14 components specified in the CFOC3 standard.

The ITQIP Coordinator also, scored the observations of diapering, hand hygiene, and medication administration. She promptly summarized the findings and then shared the summary with the center director and the linked CCHC. The summary delineated areas of strengths and areas to improve based upon the evaluation tool results including the text of the evaluation tool item, the center’s score on the evaluation tool item and the reason why the center met or did not meet the standard.

The CCHC contacted the center within 2 weeks of receiving the summary to set up the initial site visit.

Evaluation Tool
The ITQIP staff prepared the evaluation tool items from performance guidelines specified in the 13 selected CFOC3 standards. ITQIP consultants (Richard Fiene, PhD., Susan Aronson, MD, FAAP) as well as another very experienced CCHC on the ECELS staff reviewed the tool for clarity and validity of content. After several rounds of revisions, the ITQIP staff and a prospective ITQIP evaluator field-tested the tool, further revised and then field-tested it again, this time testing for inter-rater reliability also. The ITQIP evaluation tool required that the evaluators record observations in one infant and one toddler room in each center. The ITQIP Coordinator selected the rooms with the largest number of children in the age group to assess.

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

- 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)

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

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

**Table 2: 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)**
- **HI = Hand Hygiene**
- **SN = Care Plan for Children with Special Needs**
- **IM = Immunization Documentation**
RESULTS

Descriptive report

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

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

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

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

Figure 1: EVALUATION PLAN LOGIC MODEL
The CCHCs in the Immediate Intervention group provided an average of 14 hours of consultation per site. The CCHCs in the Delayed Intervention (Contrast) group provided an average of 12.5 hours of consultation per site. The most common CCHC interactions with centers included: providing health education for the director and staff, on site consultation at the facility, technical assistance by phone or e-mail, providing print or audio-visual materials, helping the facility to comply with state regulations and developing health policies and procedures.

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

Topics selected by centers in the Delayed Intervention (Contrast) group to improve were: Safe Sleep Practices and SIDS Reduction Risk (11), Care Plans for Children with Special Needs (8), Training of Caregivers/Teachers to Administer Medication (6), Hand Hygiene (5), Diaper Changing Procedures (4), Active Opportunities for Physical Activity (4), Personal Relationships (1) and Limited Physical Activity of Infants (1). None chose Immunizations.

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

**Immediate Intervention Group**
On the pre-test, the range in scores was 175 to 267 with an average score of 212 out of a possible 322 points (66%). On the first post-test, the range in scores was 213 to 297 with an average score of 254 out of a possible 322 points (79%). This change from pre-test to post-test was statistically significant ($t = -4.62; p < .0001$). The second post-test did not show any significant change from the first post-test but the initial results from the intervention were maintained (254 to 254).

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

**Immediate Intervention versus Delayed Intervention (Contrast) Groups**
The comparison of the average scores between the Immediate Intervention (212) and Delayed Intervention (Contrast) (218) groups on the pre-test were not significant. The average scores between the Immediate Intervention (254) and Delayed Intervention (Contrast) (221) groups on the first-year Post-test were statistically significant ($t = -3.46; p < .002$). The second-year Post
test showed no significant difference between the change in the post-intervention scores for the Immediate Intervention group and the Delayed Intervention (Contrast) group (254 vs 243).

The first post-test showed a significant positive change when the Immediate Intervention group received the intervention of a one-year linkage with a CCHC. The second Post-test showed a significant positive change when the Delayed Intervention (Contrast) group of centers received the services provided to the Immediate Intervention group. Persistent effects of the training/technical assistance specifically targeted to the selected standards were found for the Immediate Intervention group.

See Figure 2 for the Crossover Comparison Results.

**Figure 2: Crossover Comparison Results**

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

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

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

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

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

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

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

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

**Hand Hygiene:** Only 2 centers chose to work with their CCHC on improving hand hygiene in the Immediate Intervention group. Times that toddlers and caregivers should have their hands washed showed statistically significant improvement after CCHC linkage, but there was no similar improvement noted for infants and their caregivers. One center creatively urged parents to wash the hands of their infants and toddlers upon arrival each day with posters that suggested hand washing would avoid needing to take a vacation day or a sick day.

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

**Safe Sleep:** The number of safe sleep policies that contained all the elements that should be in a safe sleep policy per *CFOC3* standard 3.1.4.1.; documentation that parents reviewed the center safe sleep policy and were educated about safe sleep practices; removal of soft or loose bedding or other objects from a crib when an infant was in the crib and caregivers and teachers checking on sleeping infants often enough (about every 5 minutes) to be sure that the infant was still breathing. The director of one center advocated for corporate-wide use of the safe sleep policy developed with help of the center’s CCHC. This center is part of a corporation providing child care in 12 states. Thus, the development of this center’s safe sleep policy could have far reaching implications.
Medication Administration: Verification of the name of a child when medication is to be administered to that child.

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

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

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

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

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

Combining the Immediate Intervention and Delayed Intervention (Contrast) centers findings for this topic, the Pre-test revealed 66 I/T identified with special health care needs in the 32 centers that entered ITQIP. Only 15 (23%) of I/T with identified special health care needs had any Care Plan signed by a health care professional. Only 1 of 66 I/T with special health care needs had a care plan signed by a health care professional that had all necessary components for optimal daily and/or emergency care. Post-test2 revealed 39 I/T identified with a special health care need in the remaining 26 centers. Fifteen (38%) of the I/T with identified special health care needs had a care plan signed by a health professional. Four of the 15 care plans had all the required elements. Sixty-two percent of children identified by the centers as having a special health care need did not have a Care Plan at all. Examples of children who had special needs and had no care plan signed by a health care provider included children with: gastro-esophageal reflux taking Zantac, a history of febrile seizures, asthma, multiple epi-pens on site, but no care plans describing what they were needed for, autism, non-febrile seizures, torticollis and plagiocephaly, requiring a helmet be worn each day.
DISCUSSION

Acquiring knowledge is only the beginning step for improving the care of infants and toddlers. Using acquired knowledge to improve practices is more challenging. Development of policies that define best practice helps. However, policy writing is difficult work even with the templates provided in *Model Child Care Health Policies, 5th edition*. ECELS staff gave this resource to the CCHCs in hard copy and the CCHCs referred the centers to the website where they could download a copy to use. Changing policies sometimes requires corporate or board approval, which can take months, especially if the program is part of a multi-site corporation. Despite the difficulties, improvements in practice specified in selected CFOC3 standards occurred. Many of the directors said they appreciated the help they received from the CCHCs that ITQIP linked with their centers. One brief note of thanks from a program director to her CCHC said: “I am so proud of our center and how far we’ve come in our time spent during the project! You have been such an amazing consultant and I have learned so much from you. Thank you for all your insight and for helping us reach our goals! I am looking forward to our final evaluation.”

The ITQIP Director and ITQIP Coordinator provided interactive conference calls with the CCHCs. Prior to each audio-conference, the CCHCs completed a survey to identify the challenges and accomplishments in their work with their centers. The ITQIP staff used their responses to suggest topics for the conference calls and to foster exchange among the CCHCs and the ITQIP staff.

Collaboration among families, child care providers and health care professionals is required for competent inclusion of children with health care needs into child care programs. CCHCs reported that they were most successful at helping the centers have complete, useful care plans for children with disease-specific conditions. For example, for children with food allergies, CCHCs used the care plan template and educational resources from the Food Allergy Research and Education website at [www.foodallergy.org](http://www.foodallergy.org).

Hand hygiene for infants did not show improvement. For infants, teachers find it difficult to provide hand hygiene as frequently as recommended – e.g. before and after eating, after contact with body fluids from runny noses, drooling, and diapering. The caregivers/teachers of infants must be attentive to three or four infants at a time – comparable to having triplets or quadruplets. It can be difficult to hold infants at a sink to wash their hands. Some staff may simply not believe hand hygiene matters.

Pennsylvania’s child care regulations require documentation of up-to-date immunization per the recommendations of the Advisory Committee for Immunization Practice of the Centers for Disease Control and Prevention (CDC). Enforcement is assigned to the PA Department of Health that inspects a sample to provide a required report to the CDC. Measles and pertussis are reported sporadically throughout PA. By ignoring the role they can and should play to make sure children have the vaccines recommended for their age, child care providers put enrolled children and the wider community at significant risk for vaccine-preventable diseases. Knowing that their records are not likely to be inspected for up-to-date vaccine dates, many centers simply put the
form that parents bring from their child’s health care provider in their file, without making sure that the dates on the form reflect up-to-date immunization status. Lack of up-to-date immunization documentation in child care programs has been made acceptable practice by a lack of enforcement of the state regulation.

Possible Selection Bias
The centers that participated in this project were STAR 2 and STAR 3 programs that wanted to improve and were willing to contribute their time and a modest co-payment to work with a CCHC. This selection bias must be acknowledged.

Benefits of CCHC Intervention
The CCHC linkage helped improve the overall quality of specifically targeted health standards. These improvements occurred in both the Immediate Intervention group and the Delayed intervention (Contrast) group.

CCHC relationships for and beyond ITQIP
No requirement for a specific time spent in the CCHC role for each linkage was imposed. The range of time reported by the CCHCs during ITQIP was from 2 hours (2 Centers) for linkages that were not implemented, to 20 to 32 hours (7 Centers). Toward the end of the year of CCHC linkage, each CCHC sent an e-mail to their respective directors offering a continued consulting relationship on a fee basis and provided information about the CFOC3 standard regarding child care health consultation.

No center from either group continued the consulting relationship with their CCHC’s after their one year of subsidized CCHC linkage. Many center directors said the child care health consultation was very beneficial. Some said they would consider a possible continuation of the CCHC on a fee basis if they could budget for it in the future.

The improvements associated with the CCHC intervention were measurable for at least a year after the end of the CCHC linkage. This finding suggests the possibility of sustained but less intense ongoing CCHC involvement could be associated with maintenance of improvement.

Child care center budgets are stressed by many competing costs. Centers that serve infants and toddlers are caring for children at the most vulnerable time in their lives. Child care health consultation is a public health intervention worthy of funding as a required component of early education/child care programs in the same way that school health services for K-12 schools are funded.

CONCLUSIONS

The following 4 priority recommendations are based on the successful interventions in ITQIP project.

Broader Implementation of Child Care Health Consultation
1) CCHC linkages that involve establishing collaborative relationships between a health professional and early education/child care staff should be required and enabled through
professional development for center staff and reasonable financial compensation for participating health professionals. At a minimum, programs that qualify for the upper levels of the state’s Quality Rating Improvement System (STAR 3 and 4) should have a CCHC. An ongoing collaborative relationship between the program staff and their CCHC provides an effective way to foster and maintain health and safety as a foundation for quality early education/child care. This study showed that establishing a sustained CCHC linkage with child care centers is feasible with a combination of a co-payment by the child care center and external funds.

Risk Reduction Topics for Professional Development and Policy
1) Professional development for all staff members who administer medication in child care settings must occur. The content should focus on safely storing, managing and administering medication. This recommendation should be strengthened by revision of existing state regulations. A component of the professional development should involve having a licensed health professional work with the staff to assure safe and proper procedures when children receive medication in early education/child care.

2) Safe sleep policy and practices should be taught and performance observed in all child care environments that care for infants. This would ensure the safe sleep of infants in early education/child care and model what families should do at home.

3) Care plans for children with special needs should be completed by a health care professional with the components specified in CFOC3.