

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

Infant-Toddler (I/T) child care centers were recruited statewide for a quality improvement project. Project staff randomly assigned the first 37 centers that responded to either an Immediate Intervention or a one-year Delayed Intervention (Contrast) group. The intervention was assignment of a child care health consultant (CCHC) to work with the I/T center. Project staff selected 13 standards from a list provided by the Maternal and Child Health Bureau from *Caring for Our Children*.¹ An independent evaluator assessed performance of the 13 standards in the centers at project entry, 1 and 2 years later. Each center chose 3 of the 13 health and safety standards to work on with their CCHC. In the second year, in a cross-over comparison, a CCHC was assigned to work with the Contrast centers. 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 extracted from *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs, 3rd ed.* [CFOC3]¹ The grant was administered by the PA AAP’s Early Childhood Education Linkage System [ECELS].

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 CFOC3 standards, (2) assess whether compliance with these practices improve when centers are linked with a Child Care Health Consultant [CCHC]. (3) advocate for adoption of CFOC3 standards for I/T practices in Pennsylvania’s QRIS, known as Keystone STARS.

Keystone STARS rates participating child care programs from Star 1 to Star 4. The highest requirements are specified for Star 4. For I/T programs to earn STAR 4, Keystone STARS requires compliance with state regulations, and good or above scores on the 7 subscales in the nationally recognized *Infant and Toddler Environment Rating Scale-Revised Edition* [ITERS –R] (Harms, et.al 2003)² Child care programs must meet these and additional requirements for the level of STARS award sought as listed on the PA Key website. Many health and safety items are in the Personal Care Routine sub-scale of ITERS-R. Every year, scores in this subscale and health and safety items in some of the other subscales are among the lowest scoring ITERS-R items reported by the *Pennsylvania Key – Program Quality Assessment Team (Pennsylvania Key 2016.)*³ These findings are strong evidence for

an ongoing need for improvement in health and safety practices in Pennsylvania I/T child care programs.

In 1995, federal grants were available to all the states to implement Healthy Child Care America [HCCA] projects. The guidelines for this work included involving CCHCs. A National Training Institute [NTI] for CCHC trainers was established at the University of North Carolina at Chapel Hill to help states create and provide continuing support for a corps of skilled CCHCs. After more than a decade of federal funding, targeted grants to states for HCCA activities were converted to Early Childhood Comprehensive Systems grants that states could use to fund a variety of initiatives, including continuing their HCCA activities. Many states chose to use the funds to support other activities. HCCA initiatives withered. Funding for CCHC involvement was lost at the state level, and subsequently for the NTI.

Published research studies over more than a decade confirmed that child care health consultation is an evidence-based, effective quality improvement approach.⁴⁻¹⁷ 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. Practices related to active play, nutrition and food handling improved. Education and adoption of policies and procedures to reduce hazards resulted in fewer injuries. Targeted training about safe infant sleep positioning and the infant sleep environment was associated with reduced risk of Sudden Infant Death Syndrome. CCHC help to monitor and track immunizations by child care programs resulted in more children having up-to-date vaccine documentation. Most of the studies reported results from programs in which the majority of enrollees are preschool age children. Some of these cared for one or two small groups of I/Ts. Few of the reported results focused on improvements for I/T enrollees.

CCHCs use observation, education, collaborative decision-making, mentoring and coaching to achieve quality improvement in the QRIS¹⁸ (Zaslow, Tout, and Halle, 2012). CCHCs base their work on identified needs, funds and program staff availability, combining professional development using adult learning principles, technical assistance, and coaching that leads to willing and sustained improved program performance.

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 in the community. Some are staff-supervised pediatric health professional trainees. ECELS maintains a Child Care Health Consultant Registry used to regularly communicate with registered CCHCs.

Child care program budgets are strained by often unsuccessful efforts to pay teachers/caregivers a living wage. 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.

In Pennsylvania, CCHCs learn how to carry out their CCHC roles by being mentored by ECELS staff after attending ECELS-run training sessions, using ECELS self-learning media and print materials, receiving training provided by CCHC trainers who are graduates of NTI, or while receiving on-the-job experience of working with child care programs.

ECELS has a rich library of resources to support CCHCs and early education and school age child care providers working together. ECELS has produced, contributed to and offered links to updated publications, online accessible materials, checklists, software and professional development opportunities. ECELS staff have contributed to or directly developed several nationally popular publications to correspond with *CFOC3*. These publications are available from the National Association for the Education of Young Children and the AAP.^{19, 20, 21}

In addition to print publications, the AAP offers free e-learning opportunities at the Healthy Child Care America, Healthy Futures website. These address Medication Administration, Preventing and Managing Infectious Diseases and Reducing the Risk of SIDS in Child Care. The ECELS website offers more than 2 dozen self-learning modules, including media-rich, interactive newly created learning experiences, as well as workshops on corresponding topics. ECELS encourages staff members in child care programs to use the AAP and ECELS e-learning modules. CCHCs use these to supplement the in-person training they can provide to child care staff. Also, the ECELS website and ECELS staff-maintained hot line refer child care staff to national sources of credentialed health and safety information. ECELS is authorized to award and document in the PA Key transcript system state-required training credit for users of credit-bearing professional development resources maintained by ECELS.

One of the resources ECELS offers is a well-tested internet-based software application, WellCareTracker™. It is described and demonstrated at www.wellcaretracker.org. Using it enables early educators to more easily comply with the Pennsylvania regulatory requirement to have documentation for each child that shows the child is up-to-date with the preventive health services recommended by the AAP. Most new users need little more than an hour to learn how to use the software. It requires 2-4 minutes to enter the dates of routine screenings and immunizations for each child, less than a minute to add new dates of service as they occur, and seconds to generate reports. The software assesses the record of entered dates using the current nationally recommended vaccine schedule. ECELS encourages voluntary use of WellCareTracker™ by child care providers that have at least 25 children enrolled. A pediatrician, Stuart Weinberg, MD maintains the system and updates the algorithms whenever the nationally recommended vaccine schedules change. An annual subscription for WellCareTracker™ costs \$1.50/enrolled child/year plus a one-time set-Up Fee of \$25 for two passwords to access the protected Internet data storage site.

METHODOLOGY

Selection of the *CFOC3* standards to address in ITQIP

The Maternal and Child Health Bureau Funding Opportunities Announcement specified a list of *CFOC3* standards from which grantees were to select 10 standards to address in their proposed projects. ECELS asked members of Pennsylvania's Early Learning Council (state early

childhood stakeholders) to select 10 *CFOC3* standards relevant to health and safety from the large list provided by MCHB. For their selections, ECELS asked that they rank the standards they chose from 1 to 10. The criteria for ranking the potential standards were: a) the standard is closely associated with the highest and most common risks of harm to I/T, b) the standard is both measurable and amenable to improvement as a result of technical assistance and professional development provided by a child care health consultant over the course of a 12-month period, and c) state data show high levels of non-compliance with the standard. ECELS invited several early childhood state partners to 1) assign a priority rank to each of the For the proposal, ECELS chose 10 topics that were addressed in 13 standards. This selection drew from the following sources:

- Dr. Richard Fiene’s work that produced a list of 13 Indicators of Quality Child Care. These widely used as quality measures are critical standards to protect children from harm and key predictors regarding children’s positive outcomes while in child care. (Reference: Fiene, R. (2002). *Thirteen Indicators of Quality Child Care: Research Update*. Washington, D.C.: Health Resources and Services Administration/Maternal and Child Health Bureau, U.S. Department of Health and Human Services and the Office of the Assistant Secretary for Planning and Evaluation.)
- Data collected from Keystone STARS Environment Rating Scale evaluations³
- State regulation inspection findings
- Input and rankings solicited from members of the Pennsylvania Early Learning Council. (The ITQIP Director represented the PA Chapter of the American Academy of Pediatrics this council, the Pennsylvania Early Childhood State Advisory Council.)

The hypothesis for the study is that the CCHC intervention will demonstrate the feasibility and cost for linkage with a CCHC to achieve improved compliance with the selected *CFOC3* I/T standards. The participating centers had to be enrolled in Keystone STARS, and rated out of a maximum of 4 STARS at the STAR 2 and STAR 3 level.

This process identified 13 *CFOC3* standards on which to focus ITQIP. (Table 1.)

Table 1: *CFOC3* Standards Chosen as Targets for this Study

- 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

Recruitment and roles of staff in participating centers, CCHCs and Evaluators

Centers:

ECELS recruited Keystone STAR 2 and STAR 3 programs to participate in ITQIP because these programs were familiar with the benefits of Pennsylvania's QRIS. They knew they needed to improve to reach the higher 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. STAR 2 and STAR 3 centers were recruited and enrolled in ITQIP from the all but one of the 5 regions organized by Keystone STARS. The Northwest region has few centers, so no centers were recruited there.

The distribution of the 37 recruited centers among other 4 Keystone STARS regions was: 6 Southwest (Pittsburg 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 criteria for enrolling recruited centers were:

- designation as a Keystone STAR 2 or STAR 3 center
- location in one of the 4 Regional Keys targeted by ITQIP
- agreeing to the following ITQIP activities:
 - 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 access to immunization data for evaluation
 - pay a \$240.00 co-pay toward the CCHC services
 - remain in ITQIP for 3 years.

Evaluators: ECELS staff recruited 17 evaluators. They learned about the evaluation tool and how to use it by participating in a live webinar or by using the recording of the webinar. The webinar covered how to perform the 4-5-hour center evaluation. All evaluators received a copy of the evaluation tool and a manual with instructions for completing the evaluation. The evaluators helped test and establish inter-rater reliability of the final draft of the ITQIP Evaluation Tool. The ITQIP Coordinator did not link the evaluators who were CCHCs to centers that they evaluated.

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

CCHC's: ECELS recruited 14 CCHCs from the ECELS Child Care Health Consultant Registry. In addition, ECELS recruited 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 the opportunity to become a CCHC. ECELS was able to recruit, train and mentor one MIECHV nurse to work as a CCHC in the project and recruit, train and mentor 2 MIECHV nurses to be evaluators in the project. One MIECHV nurse was interested but the project was not able to recruit a center in her area. Collaborating with MIECHV was a requirement of the grant.

CCHC experience ranged from highly experienced, to beginning in the CCHC role. The ITQIP Coordinator (a master's level nurse) has worked as a CCHC for more than 15 years. She mentored and supported the work of the CCHCs who were linked with the centers. The ITQIP Director and ITQIP Coordinator gathered resources relevant to Infant-Toddler care and distributed them to the CCHCs before they were linked. This was done in association with an initial CCHC audioconference, during subsequent CCHC conference calls and with e-mails from the ITQIP Coordinator to the CCHCs related to the specific work they were doing with individual centers.

The CCHC made an initial site visit to meet staff members at the linked center and directly observe the facility practices related to the 13 selected standards, comparing these observations with the most recent evaluation summary provided by the ITQIP Coordinator. The CCHCs made subsequent visits and contacts as needed over the next 12-month period. In addition to using the findings of the independent evaluator, the CCHC solicited concerns about health and safety practices expressed by the program staff. This information focused CCHC-child care center staff discussions about needed changes to meet the *CFOC3* standards. The director, program staff and the CCHC collaboratively chose 3 *CFOC3* standards as a primary focus of improvement. Then the CCHC helped the staff prepare an Action Plan to meet the 3 standards over a year of linkage. Action Plans included filling gaps in knowledge, as well as developing policies for both staff and family handbooks. The CCHC provided coaching, technical assistance and education.

ITQIP Coordinator

The ITQIP Coordinator worked in collaboration and under the supervision of the ITQIP Director, a pediatrician (the ITQIP Principal Investigator). Quarterly, the ITQIP Coordinator reviewed CCHC's encounter forms that described their work with the centers. She discussed progress on Action Plans and referred the CCHC to relevant health and safety resources.

The ITQIP Coordinator worked with the ITQIP Director to collect, develop and share with the CCHCs supporting materials, most of which were included in the CCHC training materials. For example:

- ITQIP staff developed a Pennsylvania-specific resource list, the "Infant-Toddler Physical Activity Resource List." The list highlights specific developmentally appropriate activities both indoors and outdoors for infants and toddlers.

- The ITQIP Coordinator gave the CCHCs that were linked with the Delayed Intervention (Contrast) centers copies of “Building a Healthy Start” a DVD/CD module that addresses nutrition and the promotion of physical activity for infants and toddlers in early childhood settings to share with centers. These modules became available in the second year of ITQIP. The Alabama Department of Public Health developed the modules as part of their MCHB state grant. In addition, ITQIP gave CCHCs a copy to give to their centers. The ITQIP Coordinator mailed copies of the modules to the Immediate Intervention centers that had completed their 1 year of linkage with their CCHC.
- ITQIP staff developed two tools to help centers obtain and use care plans at enrollment to provide optimal care of children with special health care needs. These tools are available on the ECELS website at www.ecels-healthychildcarepa.org. These materials instruct child care providers that children should not be in the program if it is not safe to care for them without the care plan instructions or necessary training. The first tool is a flow chart “Process to Support Enrollment of a Child with Special Needs.” This flow chart maps the steps to follow to obtain and use a care plan. It includes introducing the care plan and the explanation of the care plan to all parents at the time of enrollment and having a written policy about care of children with special health care needs. The center director or designee is to use the care plan to determine if staff members need any professional development concerning the special need and then arrange for it. A second tool helps child care providers to assess the adequacy of content in a care plan received from a health care provider, “Care Plan Checklist for Children with Special Needs”. Using this checklist allows the director/or designee to make sure all necessary components are completed and are understood by the child care staff.
- The ITQIP Coordinator provided a copy of a diapering poster to the CCHCs as part of the resource packet they received during their training for their role in the project. ECELS helped develop this poster that relies more on illustrations than words to show the proper steps. It can be downloaded, reproduced and distributed without cost from the ECELS website. The ITQIP training encouraged the CCHCs to recommend use of the poster near the diapering table as a reminder and also for supervisor or peer evaluation of observed diaper changing technique.

Quarterly, the CCHCs sent the ITQIP Coordinator documentation of their work and progress toward goals. The CCHCs submitted the initial Action Plan and a final Action Plan that showed what was completed in their centers by the end of the year of linkage. 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. Then they received an additional \$250.00 after they submitted the final Action Plan from the 12-month linkage. The payments were funded by a combination of a \$240 co-pay collected from participating centers at the time of enrollment in the project and funds from the ITQIP grant.

Evaluation Plan

The ITQIP staff developed an evaluation tool as described below. For both the Immediate Intervention and Delayed Intervention (Contrast) groups, 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). The two groups were compared 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 were switched to continuing their choice of the components of the intervention and the centers in the Delayed Intervention (Contrast) group were switched to receive from ECELS the CCHC linkage and the same services provided to the Immediate Intervention group.

The first step in the evaluation was that the ITQIP Coordinator conducted a telephone interview with the director. In this interview, she gathered demographic data, obtained information about the number of I/T children and where they received care in the center. She asked about the I/T schedule of activities. The ITQIP Coordinator 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 immunization records were collected on site by the evaluator. The ITQIP Coordinator used WellCareTracker™ software to check a sample of up to 10 infant and 10 toddler health records drawn by the evaluator as a random sample from the files of the participating centers, with the identity of the children redacted, leaving only initials and birthdates to maintain confidentiality.

The ITQIP Coordinator asked whether the center had certain specific documents, including care plans for children with special needs. The ITQIP Coordinator asked how many I/T with special needs were enrolled at that center. If there were care plans, she asked the director to send her up to 5 care plans for review, removing names, but leaving the initials and birth dates on the records. 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.” *CFOC3* notes that any child who meets this definition should have a Care Plan completed. The standard lists 14 components necessary to consider for a child’s daily or emergency needs related to the health care need(s). The ITQIP Coordinator evaluated the submitted care plans for the presence of the required 14 components.

The ITQIP Coordinator reviewed all the data collected by the evaluators, scored the observations of diapering, hand hygiene, and medication administration, and evaluated the immunization records and care plans. She summarized the findings and then immediately after completing the summary, 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. To prepare the summary she listed the evaluation tool item number, the text of the evaluation tool item, the reason why the center met or did not meet the standard, the number of the *CFOC3* standard and the center’s score on that item.

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

Evaluation Tool

The ITQIP staff drafted the ITQIP Evaluation Tool to match the performance specified in the 13 selected *CFOC3* standards. ITQIP consultants (Richard Fiene, PhD., Susan Aronson, MD) 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 evaluator field tested the tool, further revised and then field tested it for inter-rater reliability. The tool included demographic data that the ITQIP Coordinator collected by phone from the center director or the director's designate prior to each evaluation visit. The ITQIP Evaluation Tool called for the evaluators to record observations in one infant and one toddler room in each center. Prior to the visit, the ITQIP Coordinator selected the rooms to be observed. The basis of selection was the rooms with the largest number of children in the age groups to be assessed.

The standards are narrative specifications, usually involving many different action steps. ITQIP staff and consultants developed an evaluation tool to measure these action steps. The resulting ITQIP Quality Improvement Evaluation Tool consisted of 4 sections: 1. Demographic Information, 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 reviews. Scoring for the items within 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 *CFOC3* standards. (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)

HH = Hand Hygiene

SN = Care Plan for Children with Special Needs

IM = Immunization Documentation

RESULTS

Descriptive report

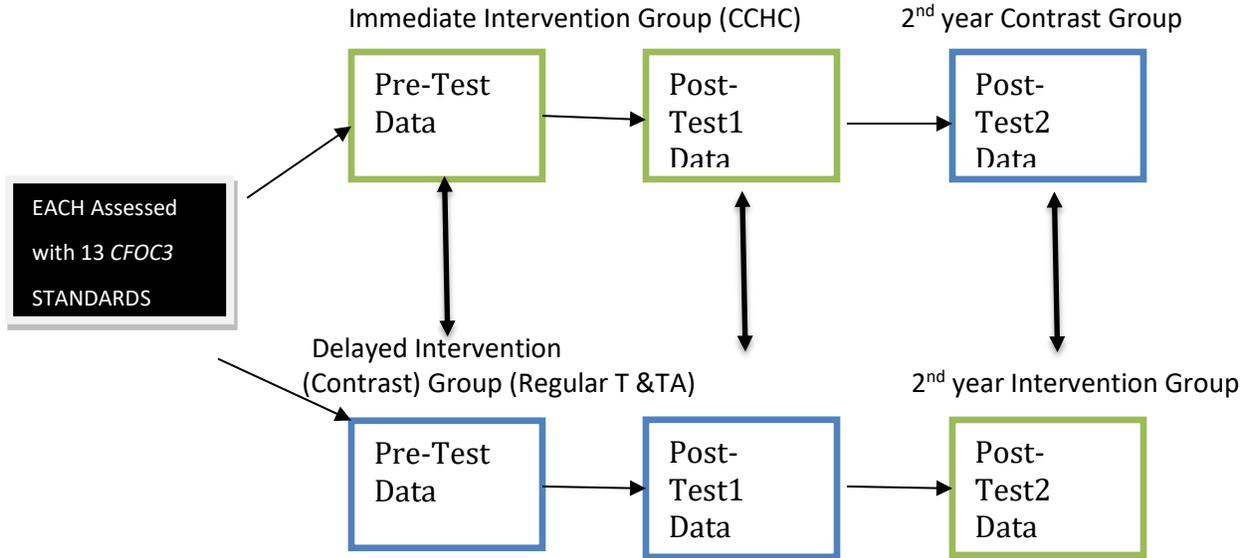
The ITQIP grant provided CCHC linkages to 37 centers. This included the 32 originally recruited centers and five add-on centers that were recruited to stand-by in the anticipation that some centers might drop out of the program. In all, 59 directors, 348 infant or toddler teachers and 1490 infants and toddlers were directly reached by the work of this grant.

Several challenges existed during the grant period. Over the one-year period of linkage of centers with a CCHC, some of the centers had more than one directors. Twelve of the 37 programs had 2 to 4 directors during the one-year period. This change in center leadership often made the work involved in improving infant and toddler care via child care health consultation extremely difficult. For the Immediate Intervention group, 3 of the original 16 centers withdrew from the grant. 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 didn'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 of the project. 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. Child care programs were randomly assigned to one of two groups. In their first year of participation in ITQIP, the Immediate Intervention group received training, technical assistance and collaborative consultation from a CCHC. The consultation was specifically targeted to the center's choice of any 3 of the 13 *CFOC3* standards selected for this project by the ITQIP staff. The Delayed Intervention (Contrast) group had access to the typical training and technical assistance that is available through the state training system in Pennsylvania for their first year in ITQIP. These two groups were compared on the pre-test evaluation for equivalency and then one year later in a post-test format. At the point of the one-year post-test evaluation, the Immediate Intervention group was switched to a cross-over comparison status, carrying-on as they chose with access to the typical training and technical assistance that is available through the state quality improvement system. After their one-year post-test evaluation, the Delayed Intervention (Contrast) group received the services previously provided to the Immediate Intervention group.

Figure 1: EVALUATION PLAN LOGIC MODEL



CCHCs and center directors or the director’s designee worked together for at least one year. 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 ways in which CCHCs interacted with centers included: providing health education for the director and staff, providing on site consultation at the facility, providing technical assistance by phone or e-mail, providing print or audio-visual materials, helping the facility to comply with state regulations or helping them to develop health policies and procedures.

Each of centers that completed one year of work with a CCHC selected *CFO3* standards related to specific topics. The topics selected by the 13 centers in the Immediate Intervention group were as follows: 11 centers worked on Safe Sleep Practices and SIDS Reduction Risk, 10 worked on Training of Caregivers/Teachers to Administer Medication, 6 worked on child abuse, 5 worked on Care Plans for Children with Special Needs, 4 worked on Diaper Changing Procedures, 2 worked on Limited Activity of Infants, 2 worked on Hand Hygiene, and 1 worked on Immunizations. None of the Immediate Intervention group chose to work on the *CFO3* standards for Personal Relationships or Active Opportunity for Physical Activity.

The topics selected by the 13 centers in the Delayed Intervention (Contrast) group were as follows: 11 worked on Safe Sleep Practices and SIDS Reduction Risk, 8 worked on Care Plans for Children with Special Needs, 6 worked on Training of Caregivers/Teachers to Administer Medication, 5 worked on Hand Hygiene, 4 worked on Diaper Changing Procedures, 4 worked on Active Opportunities for Physical Activity, 1 worked on Personal Relationships and 1 worked on Limited Physical Activity of Infants. None of the Delayed Intervention (Contrast) centers chose to work on the *CFO3* standards for Immunization.

Quantitative Comparison of Pre-Test Data 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 to the second post-test (221 to 243) ($t = -1.80$; $p < .08$) when this Delayed Intervention (Contrast) group had received the CCHC linkage and associated intervention.

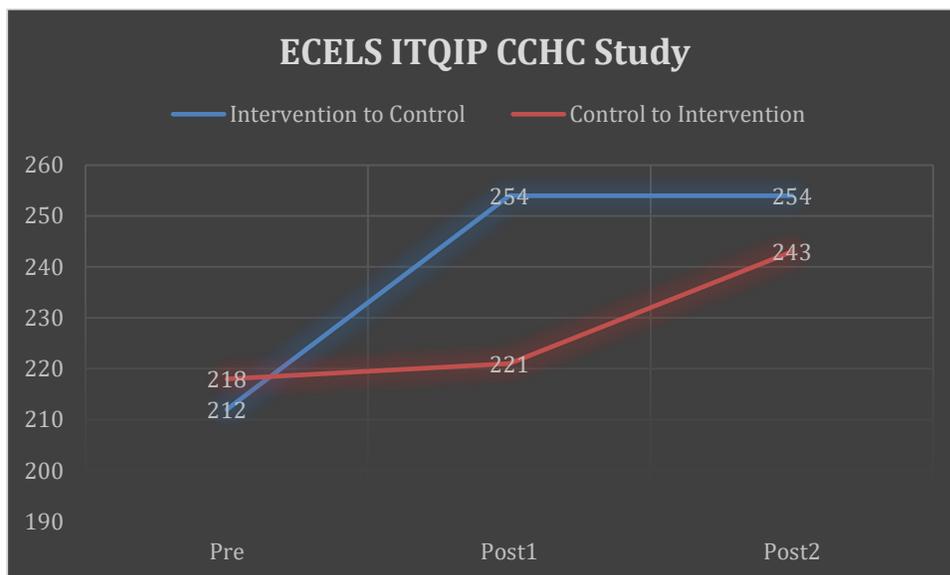
Immediate Intervention – Delayed Intervention (Contrast) Groups

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 and received the 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 topics:

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. In addition, the number of centers having required clearance documents on file for their teachers.

Active Opportunities for Physical Activity: Infants (birth to twelve months of age) should be taken outside two to three times per day, as tolerated. Toddlers (twelve months to three years)

and preschoolers (three to six years) should be allowed sixty to ninety total minutes of outdoor play. These outdoor times can be curtailed somewhat during adverse weather conditions in which children may still play safely outdoors for shorter periods, but should increase the time of indoor activity, so the total amount of exercise should remain the same. The total time allotted for moderate to vigorous activities for toddlers should be 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. Two evaluation tool items that documented the observation of the 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 urged hand washing to avoid needing to take a vacation day or a sick day.

The statistically significant changes in the *CFOC3* standards 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 of 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. In addition, 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 corporation providing child care in 12 states.

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

Diaper Changing: The bottom clothing is 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 showed statistically significant improvement.

Special Needs: Improvement in the number of care plans submitted that included all of 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 internet application maintained by ECELS, WellCareTracker™. Only 23% of infants and only 42% of toddlers had up-to-date immunization records on file at the centers on the Pre-test. One year after working with a CCHC, the Immediate Intervention group showed an improved percentage (36%), of infants with the required documentation on file. However, the Delayed Intervention (Contrast) group also improved with 38% of the records for infants showing up-to-date vaccines. In Post-test1, the up-to-date immunization records for toddlers for the Immediate Intervention group 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, the findings of the care plan review are of interest.

Combining the Immediate Intervention and Delayed Intervention (Contrast) centers findings for this topic, the Pre-test revealed 66 infants and toddlers 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 with all necessary components for optimal daily and/or emergency care. Examples of children who had special needs and had no care plan signed by a health care provider included: a child with gastro-esophageal reflux taking Zantac; a child with a history of febrile seizures, multiple children with asthma, children with epi-pens on site, but no care plan describing what they were needed for; autism; non-febrile seizures; a child with torticollis and plagiocephaly, who wore a helmet for treatment every day.

DISCUSSION

The acquisition of knowledge is only a 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.²¹ Changing policies may require 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 the ITQIP linked with their centers. This brief note of thanks from a program director to her CCHC is an example: “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 of 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 were asked to complete a survey to identify the challenges and accomplishments they had experienced 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. The ITQIP staff provided the CCHCs with care plan forms, a checklist of items to be included in care plans, education about how to use care plan forms, disease-specific care plan templates and general policy templates, and an algorithm that described the process from enrollment to participation of children with special needs.

Care Plans for Children with Special Health Care Needs: Collaboration among families, child care providers and health care professionals is required for optimal inclusion of these children into child care programs. All CCHCs were asked to share a form prepared by ECELS staff to document a care plan for children with special health care needs. This form was accompanied by a guide that explained each of the required components on the form. Many children in early care and education programs have poorly defined and understood health care needs. 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.

Hand Hygiene: There are many possible reasons why hand hygiene for infants did not show improvement. For infants, teachers find it difficult to provide hand hygiene as frequently as recommended – e.g. after contact with body fluids from runny noses, drooling, and diapering. The caregivers/teachers of infants have to be attentive to three or four infants at a time – comparable to having triplets or quadruplets; they may find it difficult to hold infants at a sink to wash their hands. Some staff may simply not believe hand hygiene matters.

Immunization: Pennsylvania's child care regulations require documentation of up-to-date immunization according to 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 small 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 them 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 a sample of 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. In ITQIP, the Pre-test to Post-test scores showed that the intervention of linking a CCHCs with participating child care centers that wanted to work with a CCHC improved their infant and toddler care.

Benefits of CCHC Intervention

The CCHC linkage helped to improve the overall quality of specifically targeted health standards, such as: receiving training for proper medication administration; receiving and reviewing safe sleep policies and training; receiving the necessary education, policies, and procedures for preventing and recognizing child abuse; following proper adult hygiene and diapering protocols; and ensuring infants and toddlers had appropriate and sufficient activities and outdoor play. These improvements occurred in both the Immediate Intervention group and when the Delayed intervention (Contrast) group was linked with a CCHC. This finding clearly demonstrated the strength of child care health consultation that provides education, technical assistance, and collaborative consultation with coaching/mentoring to comply with the selected *CFOC3* standards addressed in ITQIP. The sustainability of the CCHC intervention for at least a year after their CCHC linkage work was demonstrated by the persistence of objectively measured quality gains for a second year after the Immediate Linked centers were linked with a CCHC.

This specific intervention utilizing CCHCs to improve the quality of infant/toddler care is a viable intervention for centers that want this support. For *Caring for Our Children* standards ITQIP demonstrates that CCHC consultation on targeted standards is an effective collaborative training/technical assistance/coaching/mentoring intervention.

Continuing CCHC relationships beyond ITQIP

Toward the end of the year of CCHC linkage, each CCHC send 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 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 (2 CCHCs) for linkages that were not implemented, to 20 to 32 hours (7 CCHCs.)

The ITQIP payment for the CCHC linkage was \$500 for a year of which the co-pay from the centers was \$240. No center from either group continued the consulting relationship with their CCHC's after their one year of subsidized CCHC linkage. Many center directors expressed that the child care health consultation was very beneficial and some stated that they would consider a possible continuation of the CCHC on a fee basis but not at this time.

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. CCHC is a public health intervention worthy of funding in the same way that school health services for K-12 schools are funded. Infants and toddlers are vulnerable to health and safety risks in early education and child care settings. Education institutions for children in K-12 grades have a long tradition of support for school health. Support for programs that serve younger, more vulnerable children is an integral part of quality improvement in early care and education programs in a limited number of states.

CONCLUSIONS

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

- 1) Professional development for all staff members who administer medication in child care settings must occur. The content of the professional development should focus on safely storing, managing and administering medication. Medication Administration is the most common topic area chosen for action plan improvement in the Immediate Intervention group centers. This recommendation should be strengthened by revision of existing regulations. A component of the required professional development should involve observing those who administer medication in group settings to assure safe and proper procedures when children receive medication in 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 not only ensure the safe sleep of infants in child care. It would also model what families should be doing at home.
- 3) Care plans should be completed by a health care professional with the recommended components. Health professionals need to provide effective education of everyone involved in the care of their patients with special health care needs. All caregivers must understand and provide "reasonable accommodations" for children with any special need.
- 4) Statewide implementation of CCHC linkages that establish collaborative relationships between a health professional and center staff should be required. Lip-service to health and safety as a foundation for quality early education and child care is not enough. This study showed that establishing a sustained CCHC linkage is feasible with a combination of a co-payment by the child care center and public funds.