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School Nurses Coordinate Care
for Children and Youth with Chronic Health Conditions:
A Planning and Implementation Model
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Author Note

This paper was prepared as the Systems Change Project and submitted to Dr. Alice Swan.

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This is to certify that I have examined this
Doctor of Nursing Practice systems change project
written by

Ruth Ellen Luehr

and have found that it is complete and satisfactory in all respects,
and that any and all revisions required by
the final examining committee have been made.

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Date

DEPARTMENT OF NURSING

School Nurses Coordinate Care
for Children and Youth Children with Chronic Health Conditions:
A Planning and Implementation Guide

Abstract

Children and youth with special health care needs have the dual task of learning, growing and developing, *and* learning to live with a chronic health condition. The health care system is improving health care delivery through person-centered care and medical homes, focusing on parents as the primary care-givers. However, an important question is who is caring for the children on a daily basis? Starting as early as age four, during the school year children are in school the majority of their weekday waking hours. The school nurse is their health caregiver, teacher, advocate and collaborator, ensuring they stay healthy and safe at school. For children with chronic health conditions, school nurses' role as care coordinator is vital. With incremental change in practice, school nurses can improve their child-centered, proactive interventions and document an even greater impact on children's health status and academic success. This paper proposes a guide for school nurses in planning and implementing the care coordination role.

School Nurses Coordinate Care
for Children and Youth with Chronic Health Conditions:
A Planning and Implementation Model

Background and Significance

Schools are touted as a ‘hidden health care system’ (Lear, 2007). Yet school nurses’ positive contributions to children’s health and education have yet to be recognized. Care coordination by school nurses focusses on helping children understand their disease and medications or treatment along with teaching them critical self-care skills. Children learn to control their disease vs. the disease controlling them (Engelke, Swanson & Guttu, 2014). Studies report fewer clinic and urgent care visits and reduced hospitalizations. School nurses stabilize children’s health saving health care dollars, improve children’s school attendance saving time and money for schools and, more importantly, keeping children on track for learning (Engelke et al., 2014).

The role of school nurses as care coordinators recently received well-deserved attention: Care coordination was named a core strand in the National Association of School Nurses’ *Framework for 21st Century School Nursing Practice* (Maughan, Bobo, Butler, Schantz & Schoessler, 2015). Also, the integrative research review of McClanahan and Weismuller (2015) summarized the care coordination characteristics and the skills of school nurses that ensure children with special needs remain healthy and safe at school. And the American Academy of Pediatrics (2016) updated its position paper on the role of the school nurse, calling for a professional nurse, a Registered Nurse, in every school in America, stating school nurses have a critical role in ensuring care coordination for children and youth.

The purpose of this paper is to distill instructions on care coordination for school nurses, proposing a model, Care Coordination Arranged by Nurses in Schools (CCANS). The model

contains a Care Coordination - Individual Healthcare Plan (CC-IHP). The IHP is the planning tool of practicing school nurses. The CC-IHP includes nursing assessment and nursing interventions, both delegated medical functions and independent nursing functions, and incorporates strategies for documenting child health and academic outcomes. Concepts are derived from guidelines for comprehensive health services for children with special health care needs; pediatric care coordination guides; the NASN *Framework* (Maughan et al., 2015); the research review of McClanahan and Weismuller (2015); and draw heavily on evidence-based case management studied by Engelke, Guttu, Swanson, Warren and Loven (Engelke, Guttu, Warren & Swanson, 2008; Engelke, Guttu & Warren, 2009; Engelke, Swanson, Guttu, Warren & Loven, 2011; Engelke, Swanson & Guttu, 2014) and the Healthy Learners Model (Erickson, Splett, Mullett & Heiman, 2006a; Erickson, Splett, Mullett, Jensen & Belsth, 2006b). Having a care coordination model should assist school nurses in describing their roles and showing clear evidence of a positive impact on children's health status and academic success.

Health Care Needs of Children and Youth

Good health care is recognized as critical to the health of children and has far-reaching effects on their learning, growth and development:

Properly done, high-quality pediatric care should maximize the potential of growth, in terms of physical ability, emotional stability, and capacity to contribute to society as an adult. The benefits of excellent child health services are likely found not only in the health sector, but also in education, social service and juvenile justice sectors, as well as the economic lives of families (Raphael, Sadof, Stille, Toomey & Keller, 2014, p. 1).

Yet, health care system directives rarely recognize the needs of children – that children are not just small adults (American Academy of Pediatrics [AAP], 2014; Raphael et al., 2014). Children are not static, but *dynamic* in every aspect of their physical, social and emotional beings. Their

‘job’ is to change, to learn, grow and develop. And children are *dependent*; they need care and supervision to meet *all* of their basic needs. Of course, parents and family members are the primary care providers. But health care providers do not routinely recognize nor provide sufficient guidance regarding health care provided by others, namely the schools.

Care Coordination Definitions

Encouraged as a best practice in medicine for a decade, care coordination lacks consistency in the definition, components, measurement and payment (Bachman, Comeau & Jankovsky, 2015; Raphael et al, 2014). Bachman et al. (2015), in their work on the ‘Care Coordination Conundrum,’ posted definitions on care coordination from nine sources in the field of pediatrics alone. Antonelli, McAllister and Popp (2009) are credited with the initial definition widely quoted (Academy of Pediatrics [AAP], 2014; Association of Maternal & Child Health Programs [AMCHP], 2014):

Pediatric care coordination is a patient- and family-centered, assessment-driven, team-based activity designed to meet the needs of children and youth while enhancing the caregiving capabilities of families. Care coordination addresses interrelated medical, social, developmental, behavioral, educational, and financial needs in order to achieve optimal health and wellness outcomes (p.vi).

Care coordination by school nurses embodies the four defining characteristics of care coordination described by Antonelli et al. (2009) in *A Framework for Pediatric Care Coordination*. The characteristics are: 1) Patient- and family- centered, 2) Proactive, planned, and comprehensive, 3) Promotes self-care skills and independence, and 4) Emphasizes cross-organizational relationships. Given the first care coordination characteristic, school nurses use a child-centered approach and count on parents to be historians and health care directors. In terms of comprehensive plans, described later, school nurses plan for daily and urgent care medications

and treatments. In the work of Engelke et al. (2008), school nurses also took a proactive approach, conducting scheduled, not episodic, sessions to teach a child self-care skills. The school nurses then reinforced developmentally appropriate self-care skills when administering daily scheduled medications and episodic care.

Regarding the final pediatric care characteristic of cross-organizational relationships, school nurses facilitate communication among the health care provider, parent and school personnel. School nurses may see children *daily* in the school health services office, especially if newly diagnosed with a chronic condition such as diabetes, or when returning to school after hospitalization. Arguably, the school nurse should be identified as an essential member of the health care team, extending the goal of sharing information among specialists within the health care system, calling for external, inter-agency collaboration.

Literature Review Question

What is the structure and what are the strategies of care coordination by school nurses that differ from school nursing services provided for episodic concerns presented by children with chronic health conditions?

Literature Regarding School Nurses as Care Coordinators

Literature on care coordination from the most recent publications of the National Association of School Nurses and the references therein were selected for review. In July 2015, the National Association of School Nurses developed the *Framework for 21st Century School Nursing Practice* (Maughan et al., 2015). The intent of the framework was to describe the major functions of professional practice and facilitate communication about strategies that support children and youth to be healthy, safe and ready to learn. *School Nursing: Scope and Standards of Practice* (American Nurses Association [ANA] & National Association of School Nurses [NASN], 2011) lays the foundation for the four pillars: Care Coordination, Leadership, Quality

Improvement and Community/Public Health. Care coordination “incorporates many of the daily tasks school nurses perform to care for students and includes the practice components of student-centered care, direct care, chronic disease management, collaborative communication, motivational interviewing/counseling, nursing delegation, and student care plans” (Maughan et al., 2015, p. 222). While this view of care coordination provides an important perspective, it has a mixed list of planning tools, clinic approaches, client engagement and nursing skills. The definitions are meant to be a wide-ranging set of suggestions, but, as such, are overlapping and not discrete nor precise.

An important integrative research review showed broad consensus regarding school nurse care coordination. McClanahan and Weismuller (2015) studied the attributes, competencies and functions of Registered Nurses in schools and other pediatric settings who had roles as case managers or care coordinators, terms used interchangeably in the literature. The researchers identified six main characteristics in the twenty-five studies selected for review. They created a model with Nurse-Provided Care Coordination at the center, surrounded by care planning and the nursing process. At four points surrounding the center are Collaboration, Communication, Continuous Coordination and Clinical Expertise. Listed between the access points are Complimentary Components. The authors concluded that many school nurses embody these characteristics and need to strengthen the care coordination role, but school nurse care coordination lacked a concise definition and model. Also, “developing and improving the tools used to document and measure those outcomes and establishing baseline data from which to explain changes are crucial” (p. 41). The same argument holds for this work as did for the NASN *Framework* – the concepts are important, but broad and not prescriptive.

One other care coordination model not included in the research review above, but named in the NASN *Framework*, is the Healthy Learners Model (HLM) (Erickson et al., 2006a;

Erickson, et al., 2006b). The HLM describes the work of care coordination but does not use the term. The landmark research by Splett, Erickson, Belseth and Jensen (2006) was a randomized control trial (RCT) that linked school nursing interventions to positive student health and education outcomes. New national guidelines regarding asthma treatment spurred the development of a multicomponent intervention model in a large mid-west metropolitan school district. The HLM components were a district-wide policy with administrative support to address asthma, a three-way partnership (school nurse, parent and child with a chronic health condition, and the community clinic), professional development for school nurses and health office staff, and monthly consultation for school nurses by a resource nurse with asthma management clinical expertise. The nursing interventions were to collaborate with parents and health care providers to obtain Asthma Action Plans, prepare for routine medication administration and rescue medication administration, and use every regular and episodic interaction with the child as an opportunity to provide information and teach self-care skills. Bobo, Kaup, McCarty and Carlson (2011) replicated the model for diabetes in two other large school systems. Triggered again by revised national guidelines, Bobo et al. (2011) reported similar outcomes - improved health status, decreased absenteeism and a mixed report on change in academic standing. For children with poor academic performance, grades improved; for those with moderate to high performance, there was no measured impact. Two large school districts then used the HLM for both asthma and diabetes and applied it to school nurse interventions for attention deficit disorders and seizures (Hoxie, A., Personal communication, April, 2011).

The NASN *Framework* and the integrative review (McClanahan et al., 2015) referenced the work of Engelke and colleagues. Their definition of school nursing case management was teaching and counseling, direct care, working with school staff, working with families and making referrals (Bonaiuto, 2007; Engelke et al., 2008). Engelke et al. (2008) asked school

nurses to shift emphasis from crisis intervention to a commitment to work with students and families on an ongoing basis to control and prevent problems. Their research contributes a model that articulates not only delegated medical functions but also independent nursing functions. The school nurses' multifaceted role was applied to various children's chronic health conditions (Engelke et al., 2009; Engelke et al., 2011; Engelke et al., 2014). Engelke and colleagues used evaluation of case management to link nursing interventions to positive student outcomes.

The terms case management and care coordination have been used inter-changeably in the literature (Raphel et al., 2014). Care coordination is the current commonly used term, reflecting that a health care provider does not manage a patient, but, rather, partners with a patient to achieve positive health outcomes. Care may be provided by more than one health specialist and in more than one setting so coordination, communication and collaboration are critical to ensure comprehensive, integrated, and effective care. The client is the center-point, not the providers.

Care Coordination Arranged by Nurses in Schools (CCANS) - Structure, Process and Outcome

School nurses would benefit from a model for planning, delivering and documenting care coordination, to focus services for children, and to communicate their care coordination role to others. The Care Coordination Individual Healthcare Plan (CC-IHP) guide developed for this project draws heavily on case management developed and studied by Engelke et al. (2008) and on the Healthy Learners Models (HLM) (Erickson et al., 2006a), incorporating guidelines for pediatric care coordination (AMCHP, 2014; Antonelli et al., 2009; Bachman, 2015).

Two changes would begin to align school nursing current practice with care coordination:

- 1) While assessing the needs of the child, ask the child what his/her goals would be and what he/she would like to be different about living with a chronic health condition. This question places the onus for change on the individual, supported and guided by the health care provider,

an integral to health behavior change via motivational interviewing (Sypniewski, 2015). Parents, too, should be asked what changes they would like to see for their child. Working from the viewpoint of the client is the key principal of family/child-centered care.

2) Schedule regular weekly check-ins with the child. The check-ins should be brief but intentional to teach and reinforce self-care skills, thereby increasing self efficacy and ownership of managing the chronic health condition. The weekly encounters may occur occasionally with the child's parent, asking the parent to talk about and support the child's increasing self-care capacity. The weekly visits may be of short duration: Engelke and colleagues reported an improvement in attendance after six weeks for some children while others required a school-year commitment. They recommended a school nurse select two to four children in the trial phase of assuming the role of care coordination. Even when a school nurse served three to four schools, care coordination was do-able, although a greater impact was achieved when school nurses served one to two schools (Engelke et al., 2014). Once familiar with the role, school nurses readily expanded the number of children with whom they practiced care coordination, finding the outcomes significant for the children and rewarding for themselves, as well.

These two steps change interaction with the child, focusing away from episodic care to prevention. To demonstrate impact – for both individual children and collectively for the school – the school nurses need to establish baseline data, set measureable goals and document outcomes. Demonstrating impact is facilitated by adopting standardized language.

Using Standardized Data to Document Care Coordination

The CCANS model nursing interventions align with the Omaha System of recording health services assessment, planning and documentation (2016). The Omaha System is a standardized language used in electronic, interoperable health records by nurses and other health care colleagues in public health, clinics, mental health, elder care and other settings. The Omaha

System is goal-driven and organizes nursing interventions into the four categories: treatments and procedures (TP); teaching, guidance and counseling (TGC), case management (CM), and surveillance/monitoring (S) (The Omaha System, 2016). Three of these interventions were used in the HLM (Erickson et al., 2006a) and by Engelke et al. (2008; 2009), not including surveillance. Also, the Omaha System uses numeric scoring to assess a client's progress toward goals, a scale (1[low]-5[high]) for the client's health knowledge, health behaviors and health status. Therefore, the school nurse working in care coordination, using a structured system of planning and documentation, would find it advantageous to transition to a standardized, electronic, interoperable record for documenting children's needs, nursing interventions and outcomes.

Care Coordination Arranged by Nurses in Schools (CCANS) Model

Figure 1. MODEL: Care Coordination Arranged by Nurses in Schools (CCANS)

The CCANS model is depicted in *Figure 1*. The structure, process and outcomes include these features:

- Structure: The four structural components are Purpose, Population, Characteristics and Infrastructure. See *Figure 2*. for a full explanation of Structure.

- Process: The two process components are Goals and Nursing Interventions. Goals include a focus on the child's and family's goals, clinical intervention goals and school-related goals. The nursing interventions follow the four classifications of the Omaha System (2016): treatments and procedures (TP); teaching, guidance and counseling (TGC), collaboration (C), and surveillance (S) or monitoring. See *Figures 3 and 4*.

- Outcomes: Outcomes focus on better health and improved academics. See *Figure 3* describing goals and *Figure 5* for the baseline and results data use to determine outcomes.

Figure 2. STRUCTURE: CCANS Components

CCANS structure. *Figure 2* describes the structure of the CCANS model. The *Purpose* is to support children with chronic health conditions to be in stable health and ready to learn, willing and able, present and participating and to benefit from their educational programs. The *Rationale* states:

Care coordination is research-based model that has demonstrated reduction in barriers to learning for children with chronic health problems including improving health status and self-management skills, reducing absenteeism, improving grades, improving peer relationships and family satisfaction. (Bobo et al., 2011; Engelke et al., 2008; Engelke et al., 2009; Engelke et al., 2014; Erickson et al., 2006a; Splett et al., 2006).

The *Population* is suggested to be children with chronic health conditions who have high absenteeism and whose school work is suffering. The *Characteristics* are the work of Antonelli et al. (2009), the defining elements of pediatric care coordination: Child-centered care; promoting self-care and independence; a proactive, consistent, coordinated, effective plan; and partnerships. And the *Infrastructure* requirements that prepare and support school nurses are drawn from the Healthy Learners Model (Splett et al., 2006) and the case management body of work of Engelke and colleagues (Bobo et al., 2011; Engelke et al., 2008; Engelke et al., 2009).

CCANS process. Process includes assessment and goal setting, planning and interventions. The Individual Healthcare Plan (IHP) is a plan developed by the professional school nurse with the child who has a chronic or urgent health condition. The school nurse works with the child's parent and seeks input from the child's primary health care provider (HCP). The aim of the IHP is to ensure the child stays healthy and safe at school and that health barriers to learning are recognized and ameliorated. Developing the IHP is a standard of practice of the professional school nurse. The IHP includes goals for the child and describes nursing services to be provided (Luehr et al., 2016; National Association of School Nurses [NASN], 2014; National

Association of School Nurses [NASN], 2015; Selekman, 2013). The IHP is a roadmap that is useful not only to school nurses, but also to the selected educators with the need to know including key special education team members. Parents use the IHP to communicate with child care providers, child care providers and adult family members who care for the child (Farmer, Clark, Drewel, Swanson & Ge, 2011).

Figure 3. PROCESS 1 – ASSESSMENT: Baseline and Results Data

In the CCANS model, the centerpiece is the Care Coordination Individual Healthcare Plan (CC-IHP). The goals and interventions are based on a thorough assessment of a child's needs using a standard protocol for age, development and culturally appropriate review of health history, current health status and physical measures (Selekman, 2013). One critical element in child- and family-centered planning is asking the child and parents their goals, what they would like to be different vs. what the school nurse determines are the concerns to be addressed. (See McAllister, 2014, for a guide to child and parent interviews). According to McAllister (2014), in pediatric care coordination, there are three types of goals: child goals, parent goals and clinical goals. The work of children and youth is learning, growing and developing, therefore goals related to academics and school safety were added. See *Figure 5* for a further description of goals and *Figure 4* for nursing interventions

The CCANS model includes child and parent goals, clinical goals and academic goals. Based on the work of Engelke and colleagues (Engelke et al., 2008; Engelke et al., 2009; Engelke et al., 2011; Engelke et al., 2014), these goals are proposed for the CCANS model: Child/family goals; Stable health (incorporates clinical goals of symptom management, attaining self-care ability); Safe and Supportive School; Academic Success; and Family Supports.

Figure 4. PROCESS 2 – Nursing Interventions: CC-IHP

Nursing interventions in typical IHPs do not follow a standard format. Delegated medical functions are included as well as teaching children self-care. Communication with parents and health care providers is a ‘given’ and, therefore, often not listed as part of the plan. Surveillance – monitoring current status and anticipating needs -- is second nature to school nursing and not likely to be a part of a written plan. Therefore, the independent nursing functions of collaboration and surveillance are invisible in the plan. The CC-IHP nursing intervention section is organized according to the Omaha System. To review, three of the Omaha System interventions were part of the HLM (Erickson et al., 2006a) and in the work of Engelke and colleagues (2008; 2009). These are care (Treatments and Procedures); Teaching, Guidance and Counseling; and Case Management. In the CC-IHP model Case Management is labeled Collaboration and involves working with three distinct groups – Health Care Providers to insure *accurate care*, with Parents to insure *consistent care*, and with Teachers and other school staff to insure the child is *safe at school* – provided care to remain in stable health and staff are ready and responsive to urgent health needs. The Omaha System component of Surveillance was not included in previous bodies of work but is an essential nursing function. See *Figure 4* for the description of potential nursing interventions in care coordination. Engelke et al. (2008) called for two interventions to be included for all children in the selected care coordination population: Development of the IHP and providing psycho-social supports. Other nursing interventions are based on a child’s individual needs and goals.

Figure 5. GOALS AND OUTCOMES

CCANS outcomes. Outcomes focus on better health and improved academics. See *Figure 3* for the baseline and results data used to determine outcomes. See also *Figure 5* for how the measures are incorporated into the goals. Engelke et al. (2008) used a numeric scale for pre-post- measurement by the child, parent and teacher for certain variables: health status, self-care

activities and school issues – paying attention in class and ability to keep up with homework.

Other outcome measures are parent recall such as enumerating emergency room visits and clinic visits and reflection on Quality of Life variables. School indicators to be measured are changes in grades, attendance, behavior referrals and health office episodic visits. The Omaha System uses numeric scoring to assess a client's progress toward goals, a scale (1-5) for each of these: client's health knowledge, health behaviors and health status. The most important outcome is the child's perception of progress in self efficacy, measured by whether or not personal goals have been met.

Summary

This study is an effort to answer the call by McClanahan and Weismuller (2015) to set a standard definition and develop a model of school nurse care coordination. Care coordination requires incremental changes in school nursing practice to focus, not on responding to only to episodic needs of children with chronic health conditions, but on proactive prevention interventions that assist in stabilizing children's health, building self-care skills, improving attendance and having a positive impact on academics. The model is based on the work of two school nursing research initiatives that have shown that school nurses contribute to improving the health and academic achievement of children and youth - Healthy Learners Model (Splett et al., 2006; Erickson et al., 2006a and 2006b), and care management by Engelke and colleagues (Engelke et al., 2008; Engelke et al., 2009; Engelke et al., 2011; Engelke et al., 2014). The model is also based on a review of the guidelines and standards of comprehensive care for children with chronic health conditions and for pediatric care coordination. The model takes initial steps to incorporate a standardized nursing language, important for the future work in electronic interoperable health care records that can be shared in real time with parent and health care providers. Care coordination requires intentional change in school nursing practice. The CCANS

model is an attempt to consolidate instructions and provide a structure, process and outcome guide for school nurses taking on the role of care coordination. The CC-IHP is a planning template that can be individualized to the health condition of a child and his/her needs.

Limitations

The CCANS model draws on the evidence-based implementation models of the Healthy Learners Model (Splett et al., 2006; Erickson et al., 2006a and 2006b), and Engelke and colleagues (Engelke et al., 2008; Engelke et al., 2009; Engelke et al., 2011; Engelke et al., 2014). It does not consider evidence of strategies or techniques specific to health conditions such as asthma and diabetes that provide direction to the school nurse when individualizing the template to the needs of a child with those conditions.

CCANS is a model that needs to be vetted for content validity among the researchers whose work is the basis for its discussion and development. The model needs to be vetted among practicing school nurses for face validity and utility and then be tested for efficacy in a pilot study. Finally, CCANS uses two components of standardized nursing language from the Omaha System, namely the four nursing inventions and the pre-post intervention scoring of a client's knowledge, behavior and health status. The other Omaha System standardized language components should be aligned -- the problem statements and targets of interventions. Finally, this study did not examine the strategies for effective family - health care provider – school communication although the template is a start for discussing shared goals and a negotiated, shared plan.

Recommendations

Based on the limitations, recommendations regarding the CCANS model include:

- Determine the validity and utility of the CCANS model with school nurse researchers upon whose work the model is based and among practicing school nurses. Determine the efficiency of the model via pilot testing.

- Continue to align the CCANS model components to the Omaha System, an electronic, interoperable, standardized planning and documentation language. Design an adaptable electronic format for ease of planning, documenting, evaluating, communicating and summarizing nursing interventions and student outcomes.

- Consolidate effective assessments, interventions and outcome measures for specific conditions such as asthma, diabetes, seizures and severe allergic reactions. Align the interventions to the CCANS model.

- School nurses should use the model to describe their complex role to their education team member who may say they are not sure what to expect or what they should ask of school nurses beyond the observable medical procedures and treatments.

- CCANS is standard template aligned to pediatric care coordination guidelines. School nurses should use it to describe to the health care community their role as care coordinators for children and youth with chronic health conditions. Primary health providers, namely pediatricians and family practice physicians, advanced practice Registered Nurses (APRNs) and physician assistants, need to view the school nurse as an essential, not adjunct, member of the core health care provider team for children and youth.

- Consistently using a standard definition, components and measurement for care coordination should assist school nurses being recognized as care coordinators by the health care

industry. This will be essential when payment for care coordination is considered (Bachman et al., 2015; Raphael et al., 2014).

Conclusion

Children and youth with special health care needs have the dual task of learning, growing and developing *and* learning to live with a chronic health condition. School nurses are the primary care providers and care coordinators for children with chronic health conditions because the children are in school a majority of their weekday waking hours. School nurses, with incremental changes in their practice, provide child-centered, proactive care that fosters self-care and independence. The model, Care Coordination Arranged by Nurses in Schools (CCANS), provides a guide to planning and documenting services that can achieve a high impact on children's health status and academic success.

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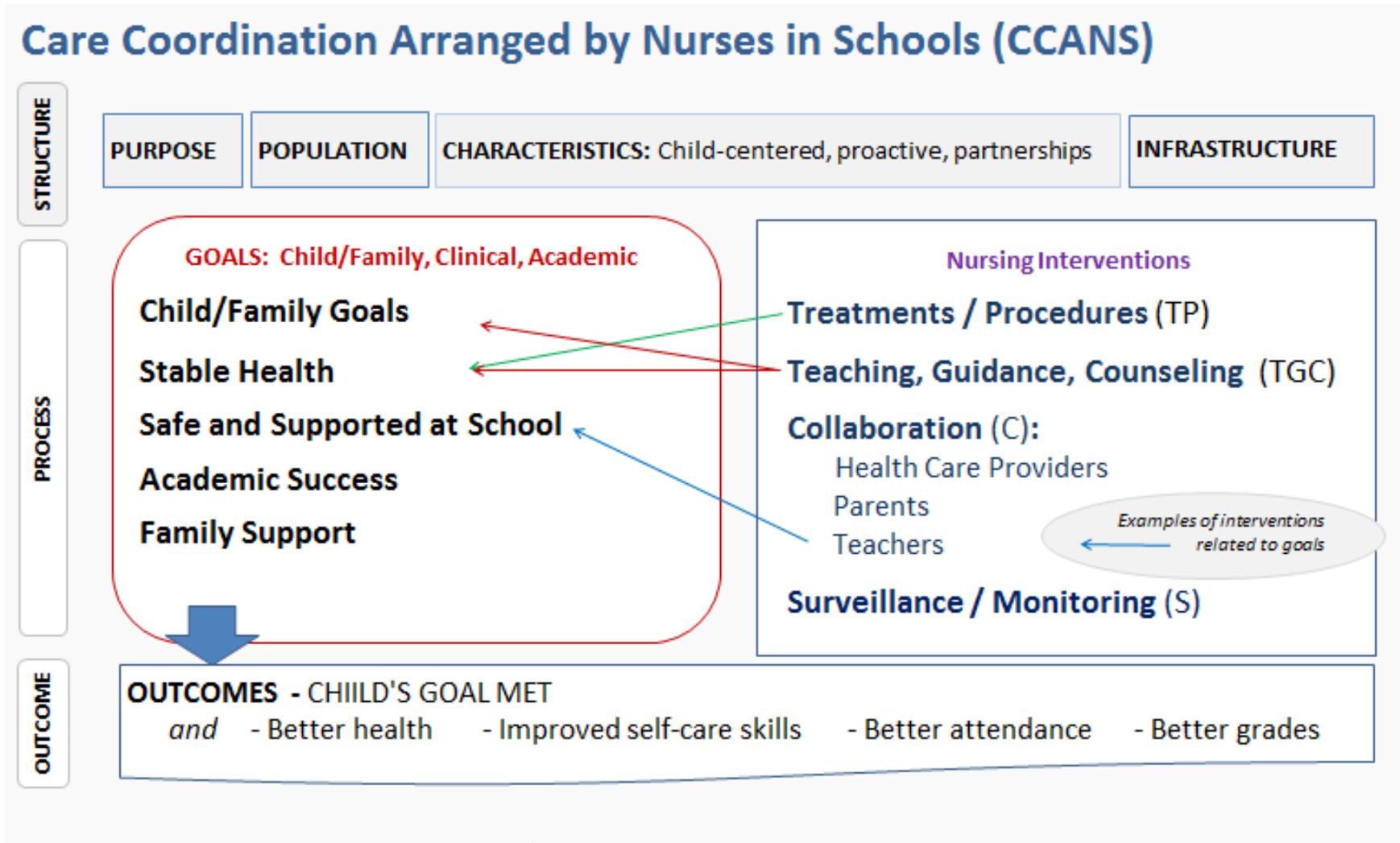


Figure 1. MODEL: Care Coordination Arranged by Nursing in Schools (CCANS)

Care Coordination Arranged by Nurses in Schools (CCANS): STRUCTURE	
Structure	System Support
Purpose:	<p>Support children with chronic health conditions to be in stable health and ready to learn, willing and able, present and participating, benefiting from their educational programs.</p> <p><i>Rationale:</i> Care coordination is a research-based model that has demonstrated reduction in barriers to learning for children with chronic health problems including improving health status and self-management skills, reducing absenteeism, improving grades, improving peer relationships, and family satisfaction (Bobo et al., 2011; Engelke et al., 2008; Engelke et al., 2009; Engelke et al., 2014; Erickson et al., 2006a; Splett et al., 2006).</p> <p><i>Characteristics:</i> “(a) collaboration, (b) communication, (c) care planning and nursing process, (d) continuous coordination, (e) clinical expertise, and (f) complementary components (family and child-centered approach, . . . early intervention geared to the developmental needs of the child/adolescent and focus on provision of culturally appropriate services within a community context” (McClanahan & Weismuller, 2015, pp. 37 and 40).</p>
Population:	<p>Children and youth who have chronic health conditions (not an episodic condition or temporary crisis) that is limiting their optimal level of health and interfering with their performance at school.</p> <p><i>Considerations:</i> Children and youth under-achieving academically, poor attendance, with a new or recent diagnosis, unstable illness, inconsistently following the health care regimen, no consistent medical care, family unable or unwilling to provide support, difficulty with peers and/or friends or and behavioral problems, additional health problems and with social-emotional risk factors, and receiving special education and related services.</p> <p>(Erickson et al, 2006a; Engelke et al., 2008; Engelke et al., 2009)</p>
*Characteristic 1. Child-centered	<p>“Person-centered practices focus on each person's abilities and strengths, including natural supports, so that he or she can maintain or work toward: What is important to him or her [and] what is important for him or her. Plans that are person-centered help children . . . develop and use resources to support their goals and preferences.” Providers “understand, respect and honor the things each person thinks are important” (Department of Human Services [DHS], 2016, webpage Person-centered practices).</p> <p>“Listening to and respecting each child and his or her family. Honoring racial, ethnic, cultural, and socioeconomic background and patient and family experiences and incorporating them in accordance with patient and family preference into the planning and delivery of health care . . . Recognizing and building on the strengths of individual children and families and empowering them to discover their own strengths, build confidence, and participate in making choices and decisions about their health care” (American Association of Pediatrics, 2012, p. 395).</p>
Characteristic 2. Promote self-care skills and independence	<p>Educate and support students/ families to make decisions and participate in their own care, including health promotion and disease prevention behaviors and supporting development of personal capacity to manage health and transition to adult independence (Erickson et al., 2006a; Maughan et al., 2015)</p>

<p>Characteristic 3. Plan: Proactive, consistent, coordinated, effective</p>	<ul style="list-style-type: none"> - Beyond responding to crises and problems, focus on prevention (Engelke et al., 2008; Erickson et al., 2006a) - Goal oriented, not random interventions, based on the specific needs of the child and evaluated based on their impact on the child (Engelke et al., 2008) - Intervene directly with the child, providing clinical services (treatments and procedures; teaching, counseling and support; and surveillance and monitoring) “that is age-appropriate, culturally specific, incremental and on-going” (Erickson et al, 2006a, p. 314), and by collaborating with parents, health care providers and teachers and staff. - Document interventions AND outcomes: Safe school environment, child’s health symptom management and self-care ability, academic success, supportive family/peer relationships; and health care coordination. Success is not based on “the number or type of interventions the school nurse implements” (Engelke et al., 2008, p. 2006).
<p>Characteristic 4. Promote partnerships</p>	<p>“Integrated services with the [child], family, health care providers, and . . . educators participating in the [child’s] care,” (McClanahan & Weismuller, 2015. p. 35)</p>
<p>Infrastructure to Support Care Coordination</p>	<p><i>Leadership:</i> Support from school administrators and community partners to refocus nursing practice (Erickson et al., 2006a)</p> <p><i>Evidence-based Practice</i> (Erickson et al., 2006a)</p> <ul style="list-style-type: none"> - Research-based strategies, integrated with school nursing expertise that focus on impact on learning that are synthesized into evidence-based guidelines for nursing practice that are adapted to unique needs of children and parent preferences) <p><i>Professional Development and Capacity Building</i> (Engelke et al., 2008; Erickson et al., 2006a)</p> <ul style="list-style-type: none"> - Professional development and reinforcement - Access to clinical expertise and resources <p><i>Protocols and Tools</i> (Erickson et al., 2006a; Guttu, M. Personal communication, July, 2014)</p> <ul style="list-style-type: none"> - Tools: Parent consent; Assessment; Set curriculum; Communication with teachers, parents and health care providers; and Documentation of baseline health and academic data, child’s goals, activities and emergencies, and outcomes.

Figure 2. **STRUCTURE: CCANS Components**

*Characteristics 1-4 derived from Antonelli et al. (2009)

Care Coordination Arranged by Nurses in School (CCANS): PROCESS – Assessment and Evaluation Data		
ASSESSMENT: Parent	ASSESSMENT: Child	ASSESSMENT: Teacher
Parent’s goal for child: What matters, is important to the parent	Child’s goal: What matters, is important to the child	x
Rating scale for items below: 1 (low) - 5 (high)	Rating scale for items below: 1 (low) - 5 (high)	Rating scale for items below: 1 (low) - 5 (high)
1) Child’s ability to manage health condition x 3) Can keep up with homework 4) Feels child is safe at school (regarding health condition)	1) Child’ ability to manage health condition 2) Can pay attention in class (concentrate and participate in class) 3) Can keep up with homework 4) Feels safe at school (regarding health condition)	1) Child’s ability to manage health condition 2) Ability to pay attention in class (concentrate and participate in class) 3) Can keep up with homework 4) Is prepared to respond to an urgent situation (Child has EAP, staff trained, and able to carry out EAP.... comfortable, willing, demonstrates tasks) 5a) Accommodates for health treatment (Staff demonstrate knowledge of health condition, treatment and impact on learning; provides supports) 5b) Accommodates for instruction/classroom needs
Measurement: Positive change, No change or Negative change	* Health and health behavior : Scale 1(low) – 5(high) - Knowledge - Behavior - Status (Omaha System, 2016)	Measurement: Positive change, No change or Negative change
Health status, health care and Quality of Life Number of clinic visits, urgent/emergency care and hospitalizations in 3 months/ year Child has regular health care provider Child has health insurance Quality of life (worry, stress on family, parent’s work)	Health status, self-care and Quality of Life Number and severity of symptoms Number and type problems with mediations/ treatments: example: - Mechanics of medication /treatment, - other interfering factors Quality of life (worry, stress, coping strategies, peer friendships, activity level and participation, satisfaction/happiness)	Academic and school participation variables - Grades - Attendance - Office referrals/behavior reports - Health services office visits (regular and episodic care)

Figure 3. **PROCESS 1-ASSESSMENT: Baseline and Results Data**, derived from Engelke et al., 2008; Engelke et al., 2009, p. 423; Omaha System, 2016.

* Note: The Omaha System is used to measure the individual client’s response to intervention. The collaborative interventions (parent and teacher) are measured by Positive change, No Change or Negative change.

Care Coordination Individual Healthcare Plan (CC-IHP): INTERVENTIONS	
	<p>Four Nursing Interventions include delegated medical functions and independent nursing functions:</p> <p>1) Treatments and Procedures (TP); 2) Teaching, Guidance and Counseling (TGC); 3) Collaboration (called Case Management in the Omaha System) with a) Health Care Providers (C-HCP), b) Parents (C-P) and c) Teachers (C-T); and 4) Surveillance or Monitoring (S)</p>
1) Treatments and Procedures (TP)	<p>Definition: Treatments and Procedures: “Technical activities such as wound care, specimen collection, resistive exercises, and medication prescriptions that are designed to prevent, decrease, or alleviate signs and symptoms of the individual/family/community” (The Omaha System, 2016, webpage Overview, Intervention Scheme).</p> <p>1) IHP and EAP – Provide for each child in CC</p> <ul style="list-style-type: none"> - Engage child and parent in developing plan of care - Given the Emergency Action Plan (EAP) from the Health Care Provider (HCP), plan who will do what when at school - Disseminate plan and explain to educator / staff who need to know; provide copy to parent for use with child care and other adult family members who care for the child; with parent permission, share with HCP <p>2) Medication/Treatment management – per school protocol</p> <ul style="list-style-type: none"> - With parent consent, obtain diagnosis (and ICD-10 code), medical order for medication and treatments, potential side effects or other concerns, activity limitations and EAP from HCP; consult with pharmacist (as needed) - Obtain from parent medication and treatment equipment; listen to parent/ child preferences regarding medication/treatment administration - Prepare medications/treatments for daily administration; prepare medication for episodic/ urgent administration including disaster planning - Delegate, train, supervise and evaluate staff who administer medications and treatments in school and other settings (ex., field trips) <p>3) Medication Administration – per school protocol</p> <ul style="list-style-type: none"> - Listen to and incorporate parent/ child preferences and effective strategies - Administer medication/treatment per training, orders and school protocol - With each medication/treatment, reinforce child’s knowledge and incremental self-care skills, providing support/problem solving - Document daily mediations and treatments; document episodic /urgent treatments - Document episodic office visits for assurance, coping or other reasons

Definition: Teaching, Guidance, and Counseling: “Activities designed to provide information and materials, encourage action and responsibility for self-care and coping, and assist the individual/family/community to make decisions and solve problems” (The Omaha System, 2016, webpage Overview, Intervention Scheme).

1) Provide psychosocial support - Provide for each child in Care Coordination

- Listen to and incorporate parent/ child preferences and effective strategies
- At each encounter with the child, reinforce knowledge, Support coping skills; teach incremental self-care skills, provide support/problem solving

2) Proactive, preventive sessions

- Schedule and meet child in short weekly sessions; occasionally parent contact may substitute – ask parent to discuss with child and support self-care efficacy
- Provide; child-centered teaching and counseling that is age-appropriate, culturally specific, incremental and on-going. (Engelke et al., 2008, p. 314); teach developmentally appropriate self-management skills. Long term goal: transition to adult independence (p. 317)
- Use child-centered Motivational Interview strategies (NASN training video) based on child’s goals:
 - Example:* For child with Asthma, child’s goal is go out for recess daily. Teach child to plan ahead for preventive inhaler dose before recess, *not* because it increase airflow (clinician’s goal), but because it ensures child will be able to play vigorously at recess (child’s goal)
- Recognize managing a chronic condition is difficult: Requires repeating actions regularly where benefits may/may not be obvious. Follow medication regime, even if awkward, inconvenient, has side effects
- Requires major changes:
 - Always alert for signs, symptoms (check at least daily), threats
 - May need to make lifestyle changes: schedules, eating, exercise, etc.
 - Take action when symptoms occur – Take measurements (peek flow, blood glucose), Use medication, Contact HCP if it reoccurs

3) Assess BASELINE, PROGRESS and RESULTS:

Using age-appropriate measurement of knowledge and skills, rate the child 1(low) -5 (high) for each:

- Knowledge - “what the client knows” - Behavior - “what the client does”
- Status - “number and severity of the client’s signs and symptoms or predicament” (Omaha System, 2016, webpage, [Problem Rating Scale for Outcomes](#))

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">3a) Collaboration - Health Care Provider (C-HCP): Accurate care</p>	<p>Definition: Case Management: “Activities such as coordination, advocacy, and referral that facilitate service delivery, improve communication among health and human service providers, promote assertiveness, and guide the individual/family/community toward use of appropriate resources” (The Omaha System, Overview, Intervention Scheme, 2016).</p> <p>1) Care plan is based on current clinical guidelines</p> <p>2) Medication/Treatment plan and medical orders - (Same as above) With parent consent, obtain diagnosis (and ICD-10 code), medical order for medication and treatments, potential side effects or other concerns, activity limitations and EAP from HCP; consult with pharmacist (as needed)</p> <p>3) Communicate plan with HCP - With HCP, parent and school nurse, establish an agreed-upon communication plan with HCP Report urgent health situations – frequency, intensity, duration, results Report health status of child periodically, especially for children with new diagnoses, complex needs and those returning to school after urgent/ emergency care and/or hospitalizations Problems regarding school / home compliance with treatment plan Impact on learning of the chronic health condition - Share IHP / school’s plan to implement EAP with parent permission - Request orders for needed supplies or equipment (ex., spacers for asthma inhalers) - Consult with HCP regarding parent and child understanding of the chronic condition and plan</p> <p style="text-align: right;">Optimal: Electronic interoperable health records</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">3b) Collaboration – Parent (C-P): Consistent care</p>	<p>1) IHP and EAP – Provide for each child in Care Coordination - (same as above) Engage child and parent in developing plan of care - (same as above) Share copies of IHP and EAP with parent for use with child care and other adult family members who care for the child; with parent permission, share with HCP</p> <p>2) Obtain Medication/Treatment plan and medical orders - (Same as above) With parent consent, obtain diagnosis (and ICD-10 code), medical order for medication and treatments, potential side effects or other concerns, activity limitations and EAP from HCP; consult with pharmacist (as needed) - (Same as above) Obtain from parent medication and treatment equipment; listen to parent/ child preferences regarding medication/ treatment administration</p> <p>3) Implement IHP – Child-Family-centered Care Coordination - Confirm parent’s understanding of the chronic condition and treatment regime; Assess comfort level with the plan - Confirm the parent’s and child’s goals (see Assessment) - Enlist support for child-centered proactive, prevention weekly sessions with the child - Provide parent information regarding age-appropriate expectations for the child’s skills, self-care, and activities - Provide strategies for socio-emotional support</p>

<p>3) Collaboration – Teachers/School Staff (C-T) - Safety and Support at School</p>	<p>1) IHP and EAP – Provide for each child in Care Coordination - (same as above) Given the Emergency Action Plan (EAP) from Health Care Provider (HCP), plan who will do what when at school - (same as above) Disseminate plan and explain to educator / staff who need to know - Remediate barriers to a having a safe environment for the child: Examples: Remove allergy triggers</p> <p>2) Medication/Treatment management – per school protocol - Train staff who administer medications and treatments in school and other settings (ex., field trips) for daily care or for urgent care according to the EAP</p> <p>3) Implement Care Coordination IHP - Provide the child’s teachers and school staff with the need to know information about the chronic condition and treatment regime (signs/symptoms, triggers, prevention) and impact on learning of the chronic health condition - Assess skills and comfort level with responding to emergencies - Problems-solve regarding school and / or home compliance with treatment plan - Enlist support for proactive, prevention – oriented weekly sessions with the child - Provide teacher information regarding age-appropriate expectations for the child’s skills, self-care, and activities - Provide strategies for psychosocial support; be alert to discrimination or bullying, changes in child’s mood, friendships or activities</p> <p>4) Provide the child accommodations - Schedule adjustments for medications and treatments - Make classroom and instructional adjustments to reduce barriers to learning</p>
<p>4) Surveillance (S) Monitor/Anticipate</p>	<p>Definition: Surveillance: “Activities such as detection, measurement, critical <i>analysis</i>, and monitoring intended to identify the individual/family/community's status in relation to a given condition or phenomenon” (The Omaha System, 2016, webpage Overview, Intervention Scheme).</p> <p>1) Emergency Action Plan (EAP) Monitor quarterly that EAP/Safety plan is in place, medication available and secure, staff recall duties</p> <p>2) Accommodations Monitor quarterly the safe school environment - remove allergens, barriers to mobility Monitor classroom accommodations: Examples: access to snacks, child with symptoms never leaves classroom alone; Instructional adjustments in place</p> <p>3) Psychosocial needs of child: Monitor supportive school environment Be alert to alienation, bullying, harassment or discrimination Child's wellbeing - depression, anxiety</p> <p>4) Plan for Transitions From urgent /emergency care or hospital to home to school Changes in schedule, activities, growth and development, mobility – may require changes in health plan Stressors in child's life that impact health conditions and educational participation (Examples: loss, family mobility) School phases: early childhood to K; any change in school; elementary to middle school; middle to high school, launching from high school Health care –from pediatric to adult care</p>

Figure 4. **PROCESS 2 - NURSING INTERVENTION: CC-IHP**

Sources: Engelke et al., 2008; Engelke et al., 2009; Luehr et al., 2016; McAllister, 2014; Omaha System, 2016.

Care Coordination Individual Healthcare Plan (CC-IHP): GOALS and OUTCOMES		
GOALS: Measure: <i>Met, Partially Met, Not Met</i>	BASELINE and RESULTS DATA: Measure: <i>Positive change, No change, Negative change</i>	NURSING INTERVENTIONS
<p>Child/Family Goals: represents what matters to the child/parent</p>	<p>Child/Family outcomes – dependent on goal; examples: <i>Quality of life improves (worry decrease, stress reduced, peer friendships improve, activity or participation increases, satisfaction/happiness improve)</i> <i>Child self efficacy increases</i></p>	<p><i>Dependent on goal including at least</i> - Teaching, Guidance, Counseling (TGS)</p>
<p>Stable Health - symptom management - self care - health care coordination for accurate care and consistent care</p> <p><i>NOTE: Select items related to the child's needs</i></p>	<p>Health outcomes: Child has an IHP/ECP - Medication authorization and orders at school - Medication/monitor equipment at school - Medications /care provided accurately and consistently</p> <p>Child reports: - Symptoms (list) decrease in number and severity - Medication/treatment problems decrease (example: how to use inhaler correctly) - Child states ability to manage health condition improves (scale 1-5)</p> <p>Child understands plan of care, participates in age-appropriate manner (example: allergies - plan of meals to avoid food allergies at parties, recognize signs and symptoms of a reaction, and how to self-administer medication)</p> <p>Child demonstrates appropriate decision-making skills</p> <p>School health office episodic visits decrease (measure in number of intervention days; there may be more than one visit per day)</p> <p>Parent /teacher report (scale 1-5): - Child's ability to manage health condition improves</p> <p>Clinic visits, urgent/emergency care and hospitalizations decrease Child has regular health care provider Child has health insurance</p> <p>Health and health behaviors improve: Scale 1(low) – 5(high) - Knowledge, - Behavior, - Status</p>	<p>- Treatments and Procedures (TP) - Teaching, Guidance, Counseling (TGS) - Collaboration Health Care Provider (C-HCP) Parent (C-P) Teachers/School Staff (C-T) - Surveillance/ Monitoring (S)</p>

<p>Safe and Supported at School</p> <p><i>NOTE: Select items related to the child's needs</i></p>	<p>Safety/support outcomes: Medications /care provided accurately and consistently Child is safe at school - Medications current (not expired), supplies and/or equipment readily available - Staff trained to respond, demonstrate knowledge of health condition - Staff provide care according to EAP in classroom, on bus, on field trips</p> <p>Child is supported at school: - Teacher makes adjustments for treatments; Accommodations for instruction made as needed</p> <p>Child and parent perception of safety at school (Scale 1-5)</p>	<p>- Treatments and Procedures (TP) - Collaboration Teachers/School Staff (C-T) - Surveillance/ Monitoring (S)</p>
<p>Academic Success</p> <p><i>NOTE: Select items related to the child's needs</i></p>	<p>Academic outcomes: Attendance improves (Health-related absences decrease) (define: absenteeism: full day out, sent home early, excused absences, health appointments) Time in class increases (Tardiness or Time out of class decreases) (define time off task/out of class) Disruptive classroom behavior decreases (define: needs urgent care often, noisy cough, office referrals for behavior problems) Full participation increases (example, physical activity increases for children with asthma)</p> <p>Teacher/Child report – (scale: 1-5) - Ability to concentrate in class increases - Participation in class increases</p> <p>Parent/Teacher/Child report: (scale: 1-5) - Ability to keep up with homework increases</p>	<p>- Collaboration Teachers/School Staff (C-T)</p>
<p>Family Support</p> <p><i>NOTE: Select items related to the child's needs</i></p>	<p>Family supports outcomes: Parent authorization for medication form is provided Family provides medications and supplies Family understanding of child's health condition and treatment increase Family participates in care consistent with IHP (example: correct medication dose at home) Family supports and reinforces weekly child-centered self-care skills sessions</p>	<p>- Collaboration Parent (C-P) - Surveillance/ Monitoring (S)</p>

Figure 5. GOALS AND OUTCOMES: CCANS Model

Sources: McAllister, 2014; Engelke et al., 2008; Engelke et al., 2009, p. 423.