By Diane Fraser

Review:

Bright Systems® Sheds Light and Lightens the Load at Pediatric Health Supervision Visits

Bright Systems®, the 2000 winner of the James A. Vohs Award for Quality, is a set of computer- and paper-based tools that has changed the way Kaiser Permanente (KP) pediatricians conduct health supervision visits within KP Northern California. The multicomponent system incorporates Speed Charting forms for physicians, health education information for distribution to parents and patients, and "patient encounter tools" explaining a variety of health topics, especially injury prevention and counseling about exposure to environmental tobacco smoke (ETS). Use of Bright Systems® has resulted in more accurate visit documentation, more personalized patient care and greater satisfaction for parents and health care professionals.

It's a typical scene in the pediatrics department of any medical center: mothers (and a few fathers) wait with their children to see the doctor for an ailment or a health supervision visit. Children sit, play, or run around. Parents page through copies of popular magazines, keeping an eye on the children's activity. Nurses and front office staff shuttle parents and children with their forms and records into and out of examination rooms.

In the examination room, a medical assistant checks the child's weight and height. The pediatrician enters the room with a blank sheet of pink paper attached to a clipboard and jots down notes while running through his own list of questions from memory. If he gets involved in talking about the importance of car seat belts, the pediatrician may never get around to asking whether the child wears a bike helmet. If time permits and the pediatrician remembers, he'll return to a question that concerned the parent and probe for more information. In the meantime, screening tests and immunizations must be given. All too soon, the parent and child are out the door, and the physician's attention turns to the next patient.

It doesn't have to be that way. Picture a waiting room where parents arrive knowing that the examination will be tailored to their child's needs. When they register, parents receive and complete a short health questionnaire that covers standard, age-appropriate risk assessment issues. The medical assistant notes the child's weight and height on a health information sheet tailored to the child's age and gives the sheet to the parent. During the visit, the pediatrician uses a printed form that prompts her to address age-specific topics related to child development, safety, and parenting and to conduct an appropriate physical examination. The physician also reviews the completed health questionnaire and discusses any areas of risk that are revealed. The parent, child, and physician all leave the visit reassured that their individual concerns were addressed along with all the fundamentals.

The secret to health supervision visits that resemble that second scenario is Bright Systems®, the 2000 winner of the James A. Vohs Award for Quality. The basic system includes five tools: the Physician Practice Survey, a spreadsheet of health supervision guidelines; Speed Charting, a set of age-specific forms to assist physicians at the patient visit; Healthy Kids-Healthy Futures, age-specific information for parents; Health Questionnaires, an age-specific risk assessment tool; and Safety Questionnaires, a data collection tool. (The Permanente Medical Group registered the name "Bright Systems®" as a trademark and retains ownership of related copyrights.)

Bright Systems® is the brainchild of Scott Gee, MD, the Project Director and Associate Director for Preventive Medicine, Regional Health Education, Kaiser Permanente (KP) Northern California Region, as well as a pediatrician at the KP Pleasanton Medical Offices. Dr Gee wanted to streamline the routine parts of health supervision visits and thereby create more opportunity for meaningful interaction with parents and patients.

"I want to be able to talk with parents about the topics that are most appropriate or are of greatest concern for them and that will reap the greatest benefits for them and their child. Standardizing when certain information is provided and giving doctors an easy way to document the discussion frees them up to engage in more meaningful, individual dialogue with parents and children," he explains.

The importance of adding efficiency and meaning to health supervision visits becomes clear when you consider that this type of visit represents half of all visits to KP Pediatrics Departments. These visits focus on preventing injuries and disease, guidance for parents, and administering screening tests and immunizations. The value of comprehensive pediatric care has been shown not only to improve children's health but also to reduce the need for hospital admissions, operations, and illness-related visits. Comprehensive pediatric care also contributes to improved parent satisfaction, increased maternal compliance with health instructions, and improved diet and maternal self-confidence.[1-7]

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Despite the demonstrated effectiveness of comprehensive health supervision visits, studies show that only a small fraction of the visit time (8.4%) is devoted to counseling and anticipatory guidance for parents.[8] Studies show that injury prevention is discussed only half the time and that few pediatricians routinely obtain family smoking histories. Furthermore, pediatricians often don't take advantage of these visits as opportunities to discuss behavioral concerns with parents.[9-12]

Yet injuries are the leading cause of death in children and adolescents and account for 600,000 hospital admissions and 16 million emergency department visits per year. The total cost associated with these injuries exceeds $7.5 million.[13-15] The issue of exposure to environmental tobacco smoke (ETS) is equally critical. ETS is estimated to contribute to 6200 childhood deaths and $4.6 million in direct medical expenses annually.[16-17]

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Bright Systems® was conceived to remedy many of these deficiencies by incorporating health care delivery tools for practitioners and front office staff; educational information for parents, patients, and health care professionals; and "patient encounter tools" on a variety of health topics, especially injury prevention and ETS counseling. Bright Systems®' objectives were to:

- Create an office system that delivers consistent and comprehensive health supervision;
- Improve the quality and consistency of anticipatory guidance given to parents at health supervision visits;
- Improve parent safety behaviors;
- Improve physician satisfaction by reducing unnecessary work.

According to David Sobel, MD, MPH, Director of Patient Education and Health Promotion, Regional Health Education in KP Northern California, Bright Systems® isn't only a win/win proposition—it's a win/win/win. "Parents win because they are happier with the quality and thoroughness of their health supervision visits and more confident thanks to the health education handouts. Physicians win because they are able to move through the routine parts of the visit efficiently allowing them to focus on individual needs and questions. And the organization wins because Bright Systems® is a cost-effective, proactive system that supports our focus on prevention and health improvement. Bright Systems® seamlessly integrates health education into ongoing clinical care."

Dewey Woo, MD, a pediatrician with TPMG, examines a patient.

A Complete Set of Tools

Bright Systems® used Total Quality Management (TQM)[18] methodologies to develop an office system (a series of routines and tools supported by all practice personnel[19]), staff training, and continuous improvement mechanisms to improve health supervision visits. As noted earlier, the basic system includes a Physician Practice Survey, Speed Charting forms, Healthy Kids-Healthy Futures sheets, and Health/Safety Questionnaires.

Physician Practice Survey

Early in Bright Systems®' development, the Physician Practice Survey helped determine and track health supervision visits at which physicians delivered specific care (eg, immunizations) or information (eg, about breastfeeding or use of child car seats). The survey was an important tool for assembling an overview of how different physicians, even within a single facility, took individual approaches to health supervision visits. This information was used to design the Bright Systems® Speed Charting forms and health information sheets.

Today, the survey incorporates the KP Northern California Region's clinical practice guidelines and serves as a convenient visual reminder for medical assistants and front office staff to prepare for and conduct health supervision visits. A quick glance at a spreadsheet reminds staff which immunizations must be given at the four-year visit, for example. In this way, the office staff knows what to be prepared for and what to prepare the parent for.

Speed Charting Forms

These age-specific, structured encounter forms give physicians a streamlined way to document the topics covered at each health supervision visit. A separate form is used at each visit from birth to age 18 years. Forms are divided into sections that include interim and social histories, nutrition, development, physical examination, health assessment, and planning. Each section contains space for written comments, but an equally important feature of the forms is a series of checklists that allow physicians to annotate the medical chart quickly, accurately, and thoroughly. Symbols are used to indicate the parent's responses to specific questions.

For example, the Development section of the form given at the 18-month visit prompts the physician to ask about and note the baby's ability to:

- Kick/throw a ball
- Use a spoon or fork
- Climb stairs (with hand held)
- Scribble
- Speak ___ words.

Like all practitioners, pediatricians have an increasing paperwork burden. It is not uncommon for them to complete six or seven pieces of paper per child per visit—not just for internal use but also for programs such as the US Department of Agriculture's Women, Infants, and Children (WIC) Program, school administrators, and US immigration authorities. "The checkoff boxes are a great timesaver, and since physicians aren't known for clear handwriting, they improve the accuracy of the documentation as well," says Deborah L. Gould, MD, Chair, Chiefs of Pediatrics, The Permanente Medical Group.

The sections and topics included in the forms and discussed at visits change as the patient ages. For example, a section about school appears on the form used for children at age six years, when questions about TV and video games also make their appearance on the forms. The social history section tracks parental marital status and the presence of smokers in the house. Prompts to ask about whether the child is in daycare or is a latchkey child and about the child's drug or tobacco use and sexual activity are added to the form as the child develops.

Although the Bright Systems®' Speed Charting forms are currently paper-based, they could readily be computerized. As KP Northern California moves closer to implementing an electronic medical record system, Bright Systems® is well positioned to adapt to this change.

Healthy Kids-Healthy Futures Sheets

Parents receive age-specific Healthy Kids-Healthy Futures information sheets when they arrive for each health supervision visit. These sheets contain basic information about feeding or eating habits, safety, healthy habits, and parenting skills. A highlighted section on the front of the sheet lets parents know what may happen at the next visit and alerts them to the possible need for immunizations or the advisability (and correct dosage) of giving acetaminophen drops to a young child.

Since her daughter Eliza was born, in July 1999, new mother Ann Banchoff has received Healthy Kids-Healthy Futures information sheets at every health supervision visit with her pediatrician at the KP San Francisco Medical Center. "It's reassuring to know that we're getting information that's been reviewed and approved by qualified doctors in an organization I trust," she says. "The sheets are a handy complement to the *Healthwise Handbook* and other books I'm using."

Parents are encouraged to share the health information sheets with others who are involved in caring for the child. Dr Gould observes, "We're seeing a lot more fathers bringing their children in for health supervision visits these days, which is great. But almost all of them come prepared with a list of questions the mother wants answered. The Healthy Kids-Healthy Futures sheets usually take care of the standard questions, and the physician has more time to address individual concerns. Plus, it's a reliable way to get important information back to the home, no matter who brings the child in."

On the back of each sheet, one or more topics are explored in more detail. These topics range from "childproofing" checklists (for use with children aged six to ten months) to temper tantrums and potty training (for toddlers) to violence prevention, puberty, and sexuality (for older children and teens).

The health information sheets also are appropriate for older pediatric patients to use in guiding their own health care choices. "It's important for Leah to get information about her own body from a reliable source other than her parents. When someone other than her mother tells her that she needs to have plenty of calcium in her diet, it's welcome reinforcement," observes Joy Carlson, who brings her 11-year-old daughter to a pediatrician at the KP Oakland Medical Center. "Even though I'm not a big fan of pamphlets, I found the Bright Systems® information very helpful as a reminder, or forecaster, of what will be happening in Leah's life in the coming months."

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Health and Safety Questionnaires

When parents register at the front desk, the receptionist or other front office staff member gives them a health risk assessment survey to complete while waiting for the doctor. The survey asks many of the routine age-specific questions a pediatrician would normally ask during a health supervision visit. Having these questions already answered by the parent (or by the teenaged patient) frees the physician to explore current issues of concern for the parent and patient in greater depth during the visit.

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Irene Takahashi, MD, Chief of Pediatrics at the KP South San Francisco Medical Center notes that the questionnaires are helpful for certifying students to participate in school athletic programs. The answers to questions such as "Have you ever had chest pain or severe difficulty breathing?" and "Have you ever fainted during exercise?" often help physicians probe for underlying physical conditions that may prevent participation and to identify the need for further medical investigation.

Separate safety questionnaires are used before and after Bright Systems® is implemented at a KP facility. As a data collection tool, these questionnaires give parents the opportunity to self-report their efforts to create safe environments for the health and well being of their children. The questionnaires query items such as appropriate use of child car seats; infant's sleeping position; efforts to "childproof" the home; and the presence and accessibility of firearms in the home. Comparing the before-and-after data measures Bright Systems®' effect in reducing safety risks.

A Culturally Sensitive Approach

The Healthy Kids-Healthy Futures information sheets are designed for people with limited literacy skills and incorporate cultural sensitivity. To reach a broad range of families, all information sheets have been translated into Spanish and Chinese. As the Healthy Kids-Healthy Futures Program is disseminated to other parts of the country, where other languages and cultures may be prominent in the Health Plan member population, local needs can be accommodated as well. In all languages, the content of the information sheets reflects a wide range of cultural preferences; for example, the sheets list a number of ethnic foods as examples of healthy eating habits.

As an example of the ongoing evolution of Bright Systems®, Dr Gould cites the current discussion over adding to the forms questions about alternative forms of medicine that parents might use. "Almost every parent gives some kind of health care at home—even if it's only acetaminophen," Dr Gould says. "Increasingly, we realize that some home remedies may include herbal therapies that could conflict with the medical advice that we give. Asking about home remedies not only gives us more information, it validates the parent's own actions in an appropriate way."

Table 1. Multidisciplinary participation in Bright Systems

Kaiser Foundation Health Plan/Hospitals	The Permanente Medical Group	State of California
Care Management Institute consulted on materials and evaluation tools	Pediatrics Departments (doctors, nurses, behavioral health specialists, medical assistants, receptionists, and health educators) consulted on materials	California State Department of Health Services consulted on anticipatory guidance and health risk assessment tools for Medi-Cal
Perinatal Services Study Group consulted on Integrated Perinatal Education program	Chiefs of Pediatrics approved and endorsed the system	Child Health Disability Program consulted on anticipatory guidance and health risk assessment tools
Compliance and Risk Management verified compliance with legal standards	Adolescent Medicine specialists approved and endorsed the system	
Temperament Program consulted on parental anticipatory guidelines	Documentation Management Committee consulted on medical records and standards	
	Committee of Health Information Managers and Physicians consulted on NCQA standards	

The program is meeting with success outside the KP organization also. In California, the Public Health Departments in Monterey and San Francisco Counties have adopted Bright Systems®. "What is happening with Bright Systems® is a perfect example of how we can fulfill our mission to improve the health of not just our members, but of the communities we serve," says Dr Sobel.

A Commitment to "Meaningful Detailing"

The impetus for creating Bright Systems® came when Dr Gee read the *Bright Futures* report issued by the Maternal and Child Health Bureau of the US Department of Health and Human Services.[1] That report, Dr Gee remembers, "gave us a vision of children's health and of what it will take for us to have healthier children. But we needed tactics and practical tools to get there."

On his own initiative, Dr Gee started to develop Bright Systems® in 1991. The next year, matching funding from Regional Health Education in KP Northern California helped Dr Gee expand the team to include a half-time health educator: Jodi Jessen, DPH. Together, Drs Gee and Jessen visited pediatricians at each KP facility to show them the Bright Systems® process and tools. "In each facility we had to prove that Bright Systems® helped physicians and staff to work more efficiently, save time, and produce better health outcomes," recalls Pamela Larson, MPH, Director of Prevention and Self-Care, Regional Health Education in KP Northern California. "We focused on the concept of 'meaningful detailing,' convincing each physician that the information collected and distributed was meaningful to parents, to patients, to physicians, and to the organization."

Before any KP facility could implement Bright Systems®, pediatricians had to agree on a common approach to health supervision visits. "Practicing Permanente Medicine means much more than practicing as a group of individuals. One of the challenges of working on a program like Bright Systems® is that it requires the physicians in a department to come together and agree on what the charting and patient education forms should contain. A helpful byproduct is that physicians across the Program learned how better collaboration and consensus building can improve medical practice," says Dr Sobel, identifying a key learning from the implementation.

The KP South San Francisco Medical Center is a good example of a facility where pediatricians struggled with the idea of using a preprinted, KP regional form to document health supervision visits. The pediatricians were concerned also about the logistics of parents completing questionnaires and receiving handouts. "We had some initial resistance," Dr Takahashi recalls. "It was only after Bright Systems® personnel explained that our views would be heard and acknowledged and that we could customize the forms to meet our needs, that we decided to join in." Among the changes that the KP South San Francisco pediatricians sought and achieved was inclusion of a screening protocol for autism at the 18-month visit. (Standard speed-charting forms have now been implemented across the KP Northern California Region.)

The KP South San Francisco facility took a phased approach to implementing Bright Systems®, using it first only for children younger than ten years of age. "We had some reservations about the usefulness and validity of the questionnaires and forms for teens," says Dr Takahashi. Among those concerns were privacy issues and having teens and parents complete separate health questionnaires. After a few physicians started using the teen materials, their value soon became apparent.

"I obtain much more valuable information from my adolescent patients now that I'm using Bright Systems®. Teenagers are clearly more willing to truthfully answer sensitive questions on a questionnaire than [when they are] being asked face-to-face. Once I have their written answers, I can focus my conversations on what matters most to each individual patient," says Dr Takahashi. "That makes the entire visit much more meaningful to the patient and to me."

Getting the front office staff actively engaged in the process was equally important to the success of Bright Systems®. "We were extremely fortunate to have the enthusiastic support of staff members who readily saw the positive effects Bright Systems® had in their offices. We couldn't have done it without them," says Ms. Larson.

Developing and implementing Bright Systems® called for the talents of a multidisciplinary team selected from Kaiser Foundation Health Plan/Hospi-

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Table 2. Kaiser Permanente (KP) Northern California Bright Systems® Team Members

KP Department	Team Member, Title
Regional Health Education	Scott Gee, MD, Project Director Pamela Larson, MPH, Project Manager Linda Rieder, MPH, Pediatric Program Manager Valerie Sheehan, MPH, Pediatric Program Coordinator Kimmie Lee, RD, MPH, Publications Coordinator
Care Management Institute	Rachelle Mirkin, MPH, Interregional Consultant

tals and The Permanente Medical Group as well as from agencies of the State of California (Table 1). Team members for the project are shown in Table 2.

Table 3. Selected parental behavior improvements achieved through use of Bright Systems®

Survey and behavior surveyed	Percentage increase
Pediatric Survey (given at 4- to 6-month visit):	
Parent received anticipatory guidance on ETS[a] exposure	28
Parent ensures correct sleeping position of infant	25
Temperature of household hot water moderated	24
Risk of scald burns reduced	23
Risk of falls reduced	17
Pediatric Survey (given at 18- to 24-month visit):	
Exposure to ETS	26
Use of syrup of ipecac	11
Use of child car seat	19
Supervision around water	23
Locks on upper-level windows	26
Risk of choking reduced	17
Safety Questionnaire (given at 4-month visit):	
Crib safety	5
Avoiding waterbeds	6
Preventing falls	5
Avoiding crib toys	9
Using safe toys	4
Safety Questionnaire (given at 9- to 11-month visit):	
Temperature of hot water moderated	10
Safety Questionnaire (given at 15- to 18-month visit):	
Preventing poisoning	5
Preventing falls	8
Avoiding foods that promote choking	9
Knowing the Heimlich maneuver	13

[a] ETS = environmental tobacco smoke

A Measurable Success

Given the high medical costs—not to mention the incalculable costs in family suffering—caused by childhood injuries, even small improvements can reap major rewards. Bright Systems® has documented major improvements in physician counseling and self-reported parental safety behavior related to key safety issues (Tables 3 and 4). Improvement in nine of the 12 injury prevention topics presented by Bright Systems® exceeds the federal Healthy People 2000 goal of 50%.[3] Physicians and staff also reported improved documentation, time savings, and improved counseling as a result of using Bright Systems®. These results were acquired using three surveys: 1) a pediatric survey collected self-reported parental behaviors and parents' recollections of anticipatory guidance received. The survey was distributed at six sites during 4- to 6-month visits ($p < .05$) and during 18- to 24-month visits ($p < .001$); 2) a safety questionnaire collected self-reported parental behaviors. The survey was distributed at most sites before and after implementation of Bright Systems®, during the 4-month visit, during the 9- to 11-month visit, and during the 15- to 18-month visit ($p < .05$); 3) a survey of physicians and other health care practitioners collected data on satisfaction as reported by a random sample of 81 KP Northern California pediatricians after Regionwide implementation. The response rate for this survey was 55% ($p < .05$).

Linda Rieder, MPH, Pediatric Program Manager at Regional Health Education in KP Northern California, notes that "our improvements in ETS and injury prevention counseling weren't achieved at the expense of answering parents' questions or screening for developmental milestones; this is proof that Bright Systems® delivers comprehensive health supervision."

Ms. Banchoff's experience supports that observation. "I was surprised to read on the handout that crib bumpers can be dangerous. I was able to ask the doctor why during our visit and got a good explanation. And I removed the crib bumpers when I got home," she recounts.

In 1997, Bright Systems® was disseminated throughout the KP Northern California Region. In addition, the KP Southern California and Mid-Atlantic Regions use the Healthy Kids-Healthy Futures materials.

A Bright and Healthy Future Ahead

Another key to Bright Systems®' success is its adaptability. Using the principles of Continuous Quality Improvement (CQI), the tools can be updated to reflect changing standards, needs, and requirements. In

addition to the changes made throughout the development phase, several modifications have been made since full implementation of Bright Systems®. Suggestions for these improvements have come from physicians and parents and in response to regulations. For example, early in 1999, when KP Northern California added rotavirus immunization to the six-month health supervision visit, the Speed Charting forms were updated to include this preventive measure; and when the decision to vaccinate was rescinded later that year, the item was removed from the forms.

More recently, when California education authorities decided to require hepatitis B vaccine for all students entering the seventh grade, the immunization was added to the speed-charting form used at the visit for 12- to 14-year-old patients. In addition, the feasibility of group visits for teens—a possibility suggested by physicians at KP South San Francisco—is being investigated.

"We learned a tremendous amount about the process of change in a large organization through Bright Systems®," says Dr Sobel. "It all started with one dedicated physician, was supported regionally in a systematic way, and incorporated the principles of CQI. It is a model for other programs."

Indeed, Bright Systems® has been extended to incorporate the Healthy Beginnings perinatal program now being used in KP Northern California. Healthy Beginnings expands standard patient education information by incorporating classes for expectant parents. The applicability of speed charting forms at perinatal visits is being studied. And KP Northern California's Regional Health Education Department is exploring how Bright Systems® might work in the adult care setting.

According to Ms. Rieder, a key to the adaptability of Bright Systems® to other settings is its simplicity. "None of the Bright Systems® tools is terribly complicated. We purposefully kept the materials simple and inexpensive to produce. That way, we can adapt and update them easily and cost-effectively." Bright Systems® is a great example of a low-tech solution that has a high impact.

Looking back at what Bright Systems® has accomplished and how much more it promises, Dr Gee is convinced that "change doesn't have to mean more work. It can—and should—mean a better, simpler way to practice, better relationships between practitioners and their patients, and better health." ❖

Table 4. Satisfaction expressed by physicians and other health care practitioners

Aspect of Bright Systems® you would recommend to other physicians	Percentage responding yes
Speed Charting materials?	88
Healthy Kids-Healthy Futures materials?	96
Health Questionnaires?	97

"It all started with one dedicated physician ..."

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