

Childhood Vaccine Risk/Benefit Communication in Private Practice Office Settings: A National Survey

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ABSTRACT. Communication about childhood vaccine risks and benefits has been legally required in pediatric health care for over a decade. However, little is known about the actual practice of vaccine risk/benefit communication.

Objectives. This study was conducted to identify current practices of childhood vaccine risk/benefit communication in private physician office settings nationally. Specifically, we wanted to determine what written materials were given, by whom, and when; what information providers thought parents wanted/needed to know, the content of nurse and doctor discussion with parents, and the time spent on discussion. We also wanted to quantify barriers to vaccine risk/benefit discussion and to prioritize materials and dissemination methods preferred as solutions to these barriers.

Methods. We conducted 32 focus groups in 6 cities, and then administered a 27-question cross-sectional mailed survey from March to September 1998, to a random national sample of physicians and their office nurses who immunize children in private practices. Eligible survey respondents were active fellows of the American Academy of Pediatrics or American Academy of Family Physicians in private practice who immunized children and a nurse from each physician's office. After 3 mailings, the response rate was 71%.

Results. Sixty-nine percent of pediatricians and 72% of family physicians self-reported their offices gave parents the Centers for Disease Control and Prevention Vaccine Information Statement, while 62% and 58%, respectively, gave it with every dose. In ~70% of immunization visits, physicians and nurses reported initiating discussion of the following: common side effects, when to call the clinic and the immunization schedule. However, physicians reported rarely initiating discussion regarding contraindications (<50%) and the National Vaccine Injury Compensation Program (<10%). Lack of time was considered the greatest barrier to vaccine risk/benefit communication. Nurses reported spending significantly more time discussing vaccines with parents than pediatricians or family physicians (mean: 3.89 vs 9.20 and 3.08 minutes, respectively). Both physicians and nurses indicated an additional 60 to 90 seconds was needed to opti-

mally discuss immunization with parents under current conditions.

Stratified analysis indicated nurses played a vital role in immunization delivery and risk/benefit communication. To improve vaccine risk/benefit communication, 80% of all providers recommended a preimmunization booklet for parents and approximately one half recommended a screening sheet for contraindications and poster for immunization reference. The learning method most highly endorsed by all providers was practical materials (80%). Other desirable learning methods varied significantly by provider type.

Conclusions. There was a mismatch between the legal mandate for Vaccine Information Statement distribution and the actual practice in private office settings. The majority of providers reported discussing some aspect of vaccine communication but 40% indicated that they did not mention risks. Legal and professional guidelines for appropriate content and delivery of vaccine communication need to be clarified and to be made easily accessible for busy private practitioners. Efforts to improve risk/benefit communication in private practice should take into consideration the limited time available in an office well-infant visit and should be aimed at both the nurse and physician. *Pediatrics* 2001;107(2). URL: <http://www.pediatrics.org/cgi/content/full/107/2/e17>; *immunization programs, physician's practice patterns, risk assessment, communication barriers, health care surveys, office management, child health services, focus groups, office management, immunization legislation, patient education, organizational culture, pediatrics, family practice, knowledge, attitudes, practice, legal liability, office immunization system, physician education, nurse education.*

ABBREVIATIONS. CDC, Centers for Disease Control and Prevention; VIS, Vaccine Information Statement.

Vaccine risk/benefit communication is a legal requirement of the National Childhood Vaccine Injury Act of 1986.¹ US health care providers must give parents/guardians the appropriate, current Centers for Disease Control and Prevention (CDC)-developed Vaccine Information Statement (VIS) and discuss, when appropriate, the risks and benefits of each vaccine being offered before administration of every dose of a routinely recommended childhood vaccine.²

Communication of childhood immunization risks and benefits has professional importance, as well.³⁻¹⁵ Parent groups deem it essential and professional organizations consider it a practice standard. The re-

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cent *Red Book* states, “the patient, parents and/or legal guardian should be informed about the benefits to be derived from vaccines in preventing disease in individuals and in the community and about the risks of those vaccines. Questions should be encouraged so that the information is understood.”¹⁶ In 1983, Fulginiti⁸ outlined what he believed parents needed to know about immunizations in an article presented before a symposium on pediatric patient education. He then raised a series of questions on how that information could be conveyed, by whom, and using what educational aids. However, 20 years later, little is known about the actual practice of vaccine risk communication in pediatric primary care.^{3,15}

Previous studies have investigated physician attitudes and compliance with recommended childhood immunization practices.^{17–24} A national survey of primary care physicians found that physicians’ perception of the risks and their concerns about litigation^{18,23} influenced their vaccine recommendations. The authors suggested that the level of appreciation for disease severity and communicability may also influence physicians’ immunization practices. Previous studies have not focused on vaccine risk/benefit communication or surveyed nonphysician office personnel who are responsible for aspects of immunization. We conducted this study to identify health care providers’:

- Current practice of vaccine risk communication: what written materials were being distributed?, when during the immunization process were they distributed?, by whom?, what was the content of vaccine risk/benefit discussion?, what discussions accompanied the materials?, and how long did this take?
- Beliefs about vaccine risk communication: how much time would be optimal?, what were the barriers?, what additional materials, if any, would be useful?, and how could these barriers be overcome?
- Attitudes toward vaccine risk communication continuing education for health care providers.

METHODS

This survey was conducted as part of a needs assessment phase of an immunization risk/benefit communication enhancement program sponsored by the CDC. Because little was known about the practice of vaccine risk/benefit communication in primary care, we needed to ensure proper hypothesis generation, instrument development, and epidemiologic measurement. Thus, we used integrated qualitative/quantitative methods as described by Debus et al.²⁵

The study and instruments were approved by the Louisiana State University Health Sciences Center-Shreveport Institutional Review Board for the Protection of the Rights of Human Research Subjects.

Participants

The target population was a broad range of primary care physicians who provided childhood immunizations and nurses who worked with these physicians. We obtained randomly generated lists of 400 pediatricians and 400 family physicians from the American Academy of Pediatrics and the American Academy of Family Physicians, respectively. Surveys of public health nurses, residents, and academic physicians and their nurses were completed and will be reported elsewhere. For the purposes of this study, we

limited the dataset by excluding emeritus members, residents, nonprimary care providers, and physicians working outside of the United States. The final eligible sample sizes for survey mailing were the practices of 212 pediatricians and 298 family physicians.

We calculated that samples of 200 respondents from each physician stratum and 400 from the nurse stratum would be adequate to measure approximate prevalence of immunization communication practices at the national level. We based this on a projected 95% confidence limit of plus or minus 7% within each physician stratum or plus or minus 3.5% within the total response population. These degrees of precision would be adequate for validation of focus group results, and the sample sizes could be obtained within the resource limitations of the study.

Questionnaire

In the initial stage of survey development, we conducted 32 focus groups in 6 cities (Albuquerque, NM; Cleveland, OH; Rochester, NY; Santa Fe, NM; Shreveport, LA; and Wichita, KS). These cities were chosen for their geographic representation, ethnic, and socioeconomic diversity, and the presence of respected academic collaborators. Separate focus groups were conducted for parents, family practice physicians, and pediatricians. Local academic collaborators assisted with recruitment. Recruitment notices were posted in public and private clinics. These notices announced the study, eligibility criteria, and incentives. The focus groups were well attended and participation was enthusiastic. During the focus groups, scripted probes were used to uncover consensus norms. Results of these focus groups have been reported elsewhere.^{26–27} Physician focus group consensus findings that led to survey questions are summarized in Table 1.

After the survey tool was drafted and reviewed by the project’s Steering Committee, it was iteratively pilot tested in 4 cities among potential respondents and revised. The survey was reviewed by the project’s Advisory Committee, which included representatives from 15 agencies (American Academy of Pediatrics, Ambulatory Pediatric Association, American Academy of Family Physicians, Society of Teachers of Family Medicine, American College of Obstetricians and Gynecologists, American Nurses Association, National Association of Pediatric Nurses And Practitioners, Association of Faculties of Pediatric Nurse Practitioner/Associate Programs, National Association of Community Health Centers Inc, Association of Teachers of Preventive Medicine, Health Resources and Services Administration, CDC, Federal Drug Administration, and McKesson Bioservice Corporation). More than 20 revisions of the content and format honed the instrument’s user friendliness to minimize respondent burden and maximize response rates. The final 5-page, 27-question survey took <10 minutes to complete. The survey questions related to demographic characteristics, current practices and beliefs regarding vaccine risk/benefit communication, and provider attitudes toward educational interventions to enhance their own vaccine risk/benefit communication. The survey instrument is available on request.

Mailings

We mailed a letter to each eligible participant requesting the physician to fill out an enclosed physician survey and requesting an immunizing office nurse to also fill out an enclosed, similarly structured questionnaire. To maintain respondent independence, each questionnaire was accompanied by a separate, stamped response envelope. Nonrespondents received a second mailing. Personal telephone prompts were conducted before nonrespondents

TABLE 1. Pediatrician and Family Physician Focus Group Consensus Findings

1. Physicians rarely discuss vaccine risks, either mild or severe.
2. Physicians fear that parents will refuse immunization: “discussion would open a can of worms.”
3. Physicians feel that there is a lack of time for vaccine discussion.
4. Physicians rarely administer vaccines personally. Nurses do this.
5. Physicians’ priority mission is disease treatment.
6. Parents rarely refuse vaccines in actual practice.
7. Physicians are unsure of what the nurses say about vaccines.

were sent a third mailing. The mailings were conducted from March to September 1998.

Data Entry and Analysis

Data were entered using Excel. Recoding and analysis were completed using *Statistical Analysis Software, Version 6.12*.²⁸ Respondents were stratified by provider type. Categorical response variables were compared using χ^2 analysis. Differences between strata among continuous variables and normally distributed ordinal variables were compared using analysis of variance. *Epi-Info, 6.04b*²⁹ was used to compare response rates by region and for other between-group comparisons.

RESULTS

Response Rates and Respondent Demographics

Among 510 physician office respondents surveyed (212 pediatricians, 298 family physicians, and 510 office nurses), responses were returned from 154 pediatricians (72.6%), 205 family physicians (68.8%), and 350 office nurses (68.6%). The overall response to the survey was 70.7%. Among all respondents, 27% were from the Midwest, 24% from the Northeast, 29% from the Southeast, and 20% from the far West. Response rates by provider types were compared across regions of the country and no statistically significant differences were found. After excluding respondents who reported not immunizing children or whose work site was not a private practice, the final study population was 217 physicians (96 pediatricians and 121 family physicians) and 219 office nurses. No effort was made to match nurse responses with those of individual physicians. Instead, responses were stratified by provider type (pediatrician, family physician, and nurse) for analysis. Demographic characteristics of these immunizing private practice respondents are shown in Table 2.

What Written Immunization Materials Are Given? When?

Respondents were asked, "In your setting, what written materials are usually given to parents regarding child immunization?" Respondents could indicate any different types of materials or combinations that they wished. Question wording did not specify frequency of distribution beyond that implied by the qualifier "usually." Physician results are shown in Table 3. Forty-two percent of physicians reported giving 2 or more different materials. Few

physicians reported giving no materials. However, sources of materials varied. Approximately two thirds of physicians reported distributing the VIS of the CDC. There was no significant difference between pediatricians and family physicians in the proportions who gave the VIS, 2 or more materials, or no materials.

Respondents were asked to indicate any or several responses to: "When are immunization materials given to parents in your setting?" From among 6 nonmutually exclusive potential choices, pediatricians, family physicians, and nurses, respectively, reported materials were distributed: "at every visit" (62%, 58%, and 62%), "when requested by parents" (38%, 34%, and 27%), and "never" (0%, 1%, and 1%). These responses were not significantly different between provider types.

Who Gives Immunizations?

Respondents were asked, "How many immunization doses have you personally administered to patients in the last 12 months?" The majority of physicians reported giving relatively few doses, compared with office nurses ($P < .01$). Nurses seemed to play the major role in immunization dose delivery (Fig 1).

Who Gives Parents the Materials? Who Discusses the Materials?

Respondents were asked to identify any office staff at their practice (eg, nurses, doctors, clerks, etc) who gave or discussed immunization materials. Physician and nurse responses were combined to produce a global picture of office staff activities and are presented in Table 4. Reported activities indicated that physicians were likely to discuss materials but not give them, whereas nursing support staff both gave and discussed materials. Separate stratified analyses were conducted and are not shown here. These analyses showed that nurses' reports of physician activities were consistent with physician reports. However, physicians' reports of nursing activities significantly underestimated the frequency of discussion of risks/benefits reported by nurses ($P < .01$).

Respondents were asked to rate from 1 to 10 how confident (10 = most confident) they were in knowing what the rest of the clinical team said when

TABLE 2. Demographic Characteristics of Respondents, by Provider Type

	Pediatricians <i>n</i> = 96	Family Physicians <i>n</i> = 121	Office Nurses <i>n</i> = 219
Race			
White	76%	94%	93%
Black	2%	2%	3%
Other	22%	4%	4%
	100	100	100
Female	30%	33%	95%
Hispanic ethnicity	7%	4%	7%
	Mean (median)	Mean (median)	Mean (median)
Years since professional school	22.0 (20)	16.6 (15)	17.3 (18)
Number of your patients age <18 y immunized each wk at your setting	81.2 (50)	16.6 (10)	63.6 (30)

TABLE 3. Physician Reports of Written Immunization Materials Given to Parents, by Physician Type

Material	Pediatricians <i>n</i> = 96	Family Physicians <i>n</i> = 121	Significance of Difference
CDC VIS	69%	72%	NS
Professional organization materials	41%	16%	<i>P</i> < .001
My own practice materials	29%	17%	<i>P</i> < .05
State or county materials	14%	26%	<i>P</i> < .05
Drug company materials	8%	5%	NS
No materials given	5%	9%	NS

NS indicates not significant.

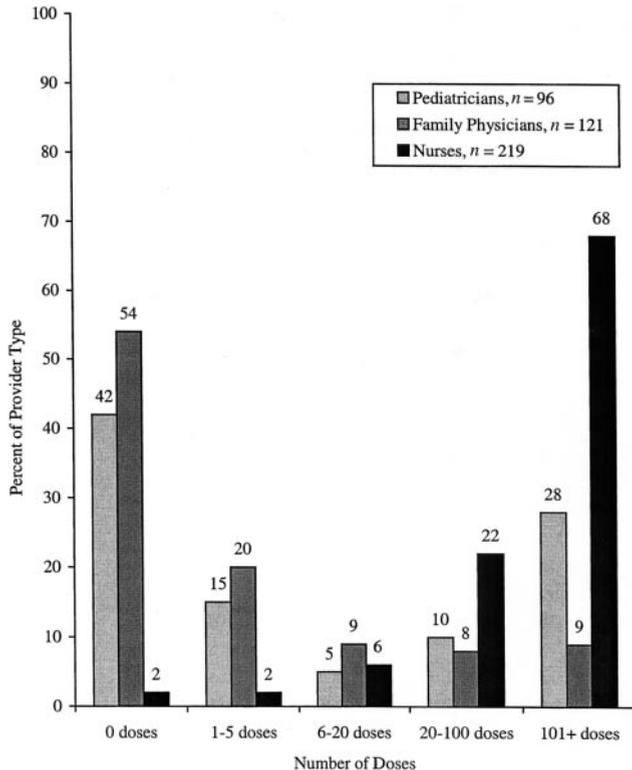


Fig 1. Number of immunization doses personally administered to patients in last 12 months.

discussing risk and benefits of immunization with parents. Providers were only moderately confident. Family physicians were significantly less confident than pediatricians and nurses (mean: 6.7, 7.9, and 7.6, respectively; *P* < .001).

To ascertain the frequency with which specific vaccine issues were discussed, we asked, “What percent of the time do you initiate discussions of the following (risk/benefit items) when child immunizations are given?” Table 5 lists the mean response for each item, stratified by provider type.

What Providers Think Parents Need/Want to Know

When asked “What do you think parents need to know about immunizations?”, physicians and nurses differed little in their responses. The majority indicated common side effects (79%), benefits of the vaccine (76%), when to call the doctor (76%), the immunization schedule (74%), contraindications (69%), and severe side effects (70%). Less than one half (47%) thought parents needed to know what the

vaccine acronyms (eg, DTaP) stand for, why so many shots (43%), the cost of the shots (36%), the statistical risk of vaccine side effects (26%), information on the National Vaccine Immunization Compensation Program (20%), or personal advice from the provider (25%). Only 3% said that parents did not need to know anything. When stratified by provider type, provider opinions differed only on one issue. Family physicians were significantly more likely than were pediatricians to indicate that parents needed to know cost (45% vs 26%; *P* < .01).

Respondents were also asked, “What do you think parents want to know about immunizations?” Only 3 items were chosen by a majority of providers: common side effects (64%), why so many shots (60%), and immunization schedule (53%). Less than one half of providers reported that parents wanted to know the remaining items: when to call the doctor (49%), benefits of immunization (45%), cost of immunization (45%), severe side effects (44%), personal opinion (42%), contraindications (36%), and meaning of acronyms (32%). A smaller number of respondents reported that parents wanted to know the statistical risk of vaccine side effects (20%) or information about the National Vaccine Injury Compensation Program (11%). Few (5%) said parents did not want to know anything. When these reports of parent interest were stratified by provider type, only one significant difference appeared. Physicians as a group reported more parent interest in severe side effects than did nurses (50% vs 38%, respectively; *P* < .05). There were no differences between family practitioners and pediatricians in any of these items.

Percent of Time Parents Initiate Questions About Side Effects/Risks

Providers were asked to estimate the percent of visits (0%–100%) in which parents initiate questions about risks of mild side effects (low grade fever, fussiness, soreness) and risk of severe side effects (seizures, polio, death). Consistent with the responses mentioned above, providers reported more parent questions about common side effects than about severe side effects. Regarding mild side effects, pediatricians, family physicians, and nurses reported that parents asked 50%, 48%, and 62% of the time, respectively (pediatricians and family physicians vs nurses; *P* < .01). Regarding severe side effects, providers reported that parents asked 28%, 24%, and 33% of the time, respectively (family physicians vs pediatricians/nurses; *P* < .01).

TABLE 4. Reports by All Respondents of Which Office Staff Give and Discuss Any Vaccine Information With Parents

Type of Staff Performing Function	Gives Immunization Materials to Parents (All Respondents) <i>n</i> = 436	Actually Discusses in Detail Risks and Benefits of Immunization (All Respondents) <i>n</i> = 436
Nurse (registered nurse and licensed practical nurse)	72%	45%
Nurse aide/medical assistant	47%	15%
Doctor	35%	81%
Nurse practitioner	15%	24%
Physician assistant	7%	10%
Clerk	4%	2%
No one	1%	2%

TABLE 5. Mean Percent of Visits During Which Risk/Benefit Information Was Discussed With Parents, by Provider Type

Discussion Item	Pediatrician (% of Visits)	Family Physician (% of Visits)	Office Nurse (% of Visits)	Significance of Difference
Common side effects	79	69*	76	<i>P</i> < .05
When to call the practice about side effects	73	64*	76	<i>P</i> < .05
Immunization schedule	73	75	77	NS
Health benefits	66	59	62	NS
Severe side effects	62	61	54	NS
Contraindications	48	46	51	NS
Experience of your patients' families	32	34	32	NS
State laws	30	32	34	NS
National Vaccine Injury Compensation Program	12	11	14	NS
How to contact the Vaccine Adverse Event Reporting System Program	12	8	15	NS

NS indicates not significant.

* Family physician versus pediatrician and nurse.

Risk/Benefit Communication Barriers

Providers were asked to check any or all of 15 barriers that might interfere with their discussion of risks and benefits of childhood immunization. Results are presented in Table 6. The most commonly selected choices among all groups were "not enough time during visit" (57% overall) and "nothing interferes" (33% overall). Of note, 25% of pediatricians and 23% of family physicians believed that discussing vaccine risks and benefits would cause parents to be unnecessarily alarmed. Respondents apparently did not equate parent alarm with outright refusal, however, because a much lower proportion (8% and 5%, respectively) believed that parents might actually refuse.

Physicians were more likely than nurses to report that lack of time, materials, or reimbursement posed barriers (*P* < .01 for each). They were also more likely to report low office priority, rarity of side effects, or the mandatory nature of vaccination as barriers to risk communication (*P* < .01, *P* < .01, *P* < .05, respectively). Neither physicians nor nurses perceived their own knowledge or skills as a barrier to vaccine risk/benefit communication.

Time Spent and Time Needed for Materials and Risk/Benefit Information Delivery

When asked how many minutes on average they currently spend discussing immunizations with parents, nurses self-reported spending significantly more time than pediatricians or family physicians (mean: 3.89 vs 9.20 and 3.08 minutes, respectively; *P* < .001). When asked how many minutes were needed to optimally discuss immunizations with parents, responses were similar by provider group (mean: 4.91, 4.69, and 4.56 minutes, respectively). Although optimal times were significantly greater than actual times currently spent (*P* < .001 for each provider type), the clinical significance of these differences is uncertain.

Immunization Materials Requested by Providers

Providers were asked what materials would be useful for them and their patients' parents. Results are shown in Table 7. For all providers, the most commonly requested material was a preimmunization booklet for parents (80%). Over one half of physicians requested screening sheets for contraindications. More nurses requested materials written in

TABLE 6. Barriers to Discussing Risks and Benefits of Childhood Immunizations, by Provider Type

Barrier	Pediatricians <i>n</i> = 96	Family Physicians <i>n</i> = 121	Nurses <i>n</i> = 219	Significance of Difference
Not enough time during visit	54%	71%*	50%	<0.01
Nothing interferes	41%	29%	32%	NS
Parents would be unnecessarily alarmed	25%	23%	15%	NS
Parents don't want to know	23%	13%	19%	NS
Not a priority	16%	19%	5%†	<.01
No easy-to-use materials	16%	18%	8%†	<.01
Parents don't understand	15%	16%	15%	NS
No reimbursement for this	14%	13%	2%†	<.01
It's not important because vaccine serious risks are so rare	13%	13%	3%†	<.01
Vaccines are mandatory so it's not important	10%‡	3%	3%	<.05
Parents would refuse	8%	5%	5%	NS
I don't know how to communicate risk	2%	1%	2%	NS
I don't like talking about potentially harming patients	3%	3%	4%	NS
I don't believe I have enough facts about the risks and benefits of immunizations	2%	6%	8%	NS
Other	8%	3%	9%	NS

* Family physician versus pediatrician and nurse.

† Office nurse versus family physician and pediatrician.

‡ Pediatrician versus family physician and nurse.

TABLE 7. Materials Requested by Providers to Communicate Risks and Benefits of Immunization, by Provider Type

	Pediatricians <i>n</i> = 96	Family Physicians <i>n</i> = 121	Nurses <i>n</i> = 219	Difference
Parent materials				
Preimmunization booklet for parents	80%	80%	80%	NS
Materials in other languages	33%	26%	40%*	<.05
Video tape	19%	23%	19%	NS
Computer programs to teach about immunization	10%	11%	9%	NS
Nothing	7%	9%	8%	NS
Other	4%	2%	1%	NS
Provider materials				
Screening sheets for contraindications	52%	53%	46%	NS
Posters about immunization facts for reference	46%	50%	56%	NS
Computer programs to manage your patient database	18%	26%	17%	NS
Nothing	13%	16%	7%*	<.05

* Nurse versus family physician and pediatrician.

other languages than did physicians (40% vs 29%, respectively; $P < .05$). Only 7% of nurses and 14% of physicians wanted no new materials.

How Providers Like to Learn

Respondents were asked to check all the ways they liked to learn (Table 8). For all groups, the highest interest shown was in practical materials and articles (80%). The least interest was shown for trial and error and role playing. Preferences for other learning methods varied significantly by provider. Physicians liked to learn by lecture with slides significantly more than did nurses ($P < .05$). Pediatricians liked to learn by reading research journals significantly more

than did family physicians or nurses ($P < .05$). Family physicians preferred interactive computer programs significantly more than did the other providers ($P < .05$). Nurses liked to learn with small group discussion, videotape, repetition, supervision/shadowing, and television conferences significantly more than did physicians ($P < .01$ for each).

Among pediatricians, family physicians, and nurses, 74%, 82%, and 54%, respectively, reported computer Internet access ($P < .01$). On a scale of 1 to 10, however, respondents rated their ability to navigate and use Internet resources only moderately. Self-ability ratings were a mean of 6.0, 6.0, and 5.9 among pediatricians, family physicians, and nurses,

TABLE 8. Provider Learning Preferences, by Provider Type

Learning Method	Pediatricians <i>n</i> = 96	Family Physicians <i>n</i> = 121	Nurses <i>n</i> = 219	Significance of Difference
Reading methods				
Practical materials/articles	79%	82%	81%	NS
Research journals	55%*	41%	38%	<0.05
Internet materials	22%	23%	22%	NS
Interactive methods				
Small group discussion with peers	43%*	51%	60%	<0.05
Supervision/precepting/ shadowing	2%	7%	23%†	<0.01
Simulated patient role play	1%	2%	5%	NS
Visual methods				
Video tape	23%	26%	51%†	<0.01
Interactive computer program	22%	34%‡	19%	<0.01
Television conference	9%	6%	23%†	<0.01
Auditory methods				
Lecture and slides	58%	56%	45%†	<0.05
Audio tape	36%	38%	30%	NS
Other methods				
Repetition	17%*	26%	37%	<0.01
Trial and error	5%	6%	6%	NS
Other	3%	2%	3%	NS

* Pediatrician versus family physician and nurse.
 † Nurse versus family physician and pediatrician.
 ‡ Family physician versus pediatrician and nurse.

respectively. In this 1998 study, fewer than 1 in 4 providers in private practice showed interest in using Internet materials as a learning tool.

Attitudes Toward Training in Communicating Risks and Benefits

Respondents were asked to rate their training in communicating risks and benefits of procedures and immunizations and their willingness to participate in a short, interesting, risk/benefit communication training (Table 9). When compared across provider types, pediatricians reported significantly less training in communicating risks and benefits of procedures (*P* < .01). Nurses reported the most training in communicating risks and benefits of immunizations (*P* < .01). Pediatricians and family physicians were only moderately interested in this type of training; nurses were significantly more interested (*P* < .01).

When Should Communicating Immunization Risks and Benefits Be Taught?

Respondents were asked, “When should communicating immunization risks and benefits be taught to someone in your profession?” Participants were

allowed to choose any and all career stages in which such training would be appropriate. Among pediatricians, family physicians, and nurses, respectively, preferences for training times were professional school (58%, 80%, and 72%), residency/supervised orientation period (81%, 88%, and 54%), and by in-service continuing education (54%, 63%, and 71%). We interpreted these to indicate general high interest in the topic at all stages of career. Less than 1% of all respondents believed that this should never be taught. An additional unspecified “other” time was suggested by 1%, 1%, and 6% of pediatricians, family physicians, and nurses, respectively.

DISCUSSION

This study is the first to measure self-reported compliance with the 1986 National Childhood Vaccine Injury Act¹ and current practices of childhood vaccine risk/benefit communication in private practices nationwide. Because we gathered data both from nurses and from physicians, this research was the first to analyze the role of nonphysician office personnel in the immunization communication process. The integration of qualitative and quantitative

TABLE 9. Training Completed and Desired for Communicating Risks/Benefits, by Provider Type

Mean Rating of Previous Training (Scale 1-10)*	Pediatricians	Family Physicians	Nurses	Significance of Difference
Risks/benefits of procedures	5.4†	6.3	6.6	<i>P</i> < .01
Risks/benefits of immunization	5.3	5.5	6.7‡	<i>P</i> < .01
Mean rating of interest in short, interesting training (scale 1-10)§	5.9	6.0	7.7‡	<i>P</i> < .01

* 1 = very little; 10 = very much.
 † Pediatricians versus family physicians and nurses.
 ‡ Nurses versus family physicians and pediatricians.
 § 1 = not at all likely; 10 = very likely.

methods^{26,27} provided insight into the epidemiology as well as the qualitative issues related to childhood immunization risk/benefit communication. We believe that our findings have important implications for improving vaccine risk/benefit communication.

Current Practices—VIS Distribution and Discussion

The distribution of current VIS forms before every immunization as required by law is the most elemental form of childhood immunization risk/benefit communication. Of major interest to us was the low self-reported compliance with the 1986 National Childhood Vaccine Injury Act,¹ which requires distribution of the CDC VIS forms before every dose of each vaccine. We found that almost all providers reported that, in their setting, some written material was given with the most commonly distributed material being the CDC VIS forms. However, the current immunization information practices of more than one third of physicians fell short of the standard of care. Despite the law becoming effective in 1988, 31% of pediatricians and 28% of family physicians in private practice reported that their offices were not using the VIS at all, and 38% and 42%, respectively, were not giving the VIS at every visit. It is important to note that these data may overestimate compliance because they are based on self-report.

The literature and our focus groups of parents indicated that even if parents were given the VIS forms, they still desired verbal information from their primary provider.^{8,26,30} Consensus opinions of the parents in our focus groups indicated that parents were most interested in information they deemed relevant and practical, ie, what side effects to expect, how long such symptoms would last, how to treat side effects, when to call the clinic, the schedule of the next shot, etc. They also wanted brief, simple information about rare, severe risks, ie, “there is a very small chance of something bad happening—like brain damage.” It was important to parents that their primary provider give this information. It was seen as a matter of respect and trust that parents had in their provider. In one of the few articles that focuses specifically on vaccine risk communication, Ball et al⁷ stated that the responsibility for vaccine risk communication rests on the primary care provider who administers the vaccines; yet the literature reports that physicians say little to parents about immunizations.^{8,9,26,27,30} We could find no quantitative studies reported in the literature that specify the proportion of parents wanting information on specific vaccine risk/benefit topics. The law and professional guidelines are vague about the content of vaccine risk/benefit communication. However, as with other medical information and the informed consent process, the physician must determine what each individual patient needs to know to be truly informed about risks and benefits.

Perceived Parent Needs and Physician Practices

Nearly all providers (97%) thought that parents needed to know some vaccine information. The majority (70%–80%) of providers thought that parents needed to know about common side effects, when to

call the clinic about the side effects, severe side effects, benefits, contraindications, and the schedule. Providers tended to discuss what they believed that parents needed to know; the exception was contraindications. Sixty-nine percent of providers believed that parents needed to know contraindications, yet physicians reported that they actually discussed contraindications in less than one half of visits.

With the exception of family physicians, most respondents did not address immunization cost. Cost may not be viewed by providers as an issue worth discussing in private practices, where families have insurance coverage paying for vaccines, are referred to public health clinics for immunizations, or are eligible for Vaccines For Children Program free vaccines.²²

Few respondents thought that parents needed to know the exact mathematical probability of rare but serious vaccine side effects or information about the National Vaccine Injury Compensation Program. Similarly, respondents reported rarely discussing the National Vaccine Injury Compensation Program or how to contact the Vaccine Adverse Event Reporting System.

A Systems Approach to Office-Based Vaccine Risk/Benefit Communication

Our data indicated that office nurses had a high investment in immunization: they had more training in risk/benefit communication and desired more training than physicians; and their role, the content of their immunization discussion, and the amount of time that they spent differed significantly from physicians. Nurse/parent communication was an important aspect of the immunization process.

The team approach to vaccine risk/benefit communication by doctors and nurses needs to be recognized, coordinated, and strengthened. Government directives, academy guidelines, and research interventions need to include the nurse and focus on the office team. The law and academy guidelines also need to be clear concerning whether physicians need to discuss risks or whether others in the office immunization staff besides physicians can provide this service. Following a systems approach, the office may be able to provide more complete vaccine risk/benefit communication, while reducing duplication, and, therefore, time demand.

Barriers to Immunization Risk/Benefit Communication

The most common barrier physicians and nurses reported to childhood vaccine risk/benefit communication was time. Providers completing the survey advocated spending more time than they currently spend on vaccine risk/benefit communication.

Nearly 1 in 4 physicians indicated that “parents would be unnecessarily alarmed” and a surprising number of providers believed “parents did not want to know” vaccine risks/benefits. Of note, these physician and nurse perceptions are not supported by the risk communication literature or by our parent focus groups, which found that patients/parents trusted information from their physician, wanted to receive risk/benefit information from them, and ex-

pected brief information about risk as a matter of respect.^{7,10,17,26–28,30} Stoto et al¹⁵ of the Institute of Medicine's Vaccine Safety Forum has pointed out that "people appreciate receiving vaccine risk information; it is a fundamental form of respect and it indicates they are treated more equally in the decision-making process. . . ."

Of note, 41% of pediatricians, 29% of family physicians, and 32% of nurses indicated that there were no barriers to risk/benefit communication. Also, most providers did not perceive any inadequacy in their knowledge or skills as barriers to risk communication. Only 1% to 8% indicated "they didn't have enough facts," "didn't know how to communicate risk," or "didn't like talking about potentially harming patients."

Issue of Time

Physicians and nurses in our study reported spending slightly >3 minutes on average discussing vaccine risk/benefit information with parents. Nurses reported spending the most time. The only time-motion study we could find that examined this issue was conducted in 7 private and public clinics in a single city in the Northeast.⁵ Time-motion analysis in these clinics revealed that primary providers (physicians and nurse practitioners) devoted a median of 1.9 minutes to discussion of all aspects of vaccination. Nurses in the same clinics devoted a median of .0 minutes to discussion of vaccination, but performed all the immunization dose administration. The mild divergence from the results in our study may be caused by self-reported bias in our national survey or by the unique nature of the 7 time-motion study clinics compared with our national survey sample.

Materials for Improving Vaccine Risk/Benefit Practice

Nearly all providers indicated that additional materials would improve risk/benefit communication and would be useful for them and their parents. The most frequently requested material for parents was a preimmunization booklet (80%). Previous studies³⁰ and our focus groups²⁷ found that parents wanted the VIS information in booklet form, ideally given to them before the immunization visit. "Materials written in other languages" were requested by one third of physicians and significantly more often by nurses. In response to this 1998 survey, few physicians requested technological tools, such as video tapes and computer programs, to teach parents about immunization.

The most commonly requested materials for the providers themselves were screening sheets for contraindications (52%). This may be important because more than one half of physicians reported that they did not screen for contraindications and the literature indicates that many physicians lack understanding of true contraindications.^{20,24,32} Approximately one half of physicians and nurses also requested a poster about immunization facts for reference. Only approximately 1 in 5 requested a computer program to manage their patient database.

Implications for Continuing Education Aimed at Doctors and Nurses

Currently the law and the *Red Book* do not specify appropriate content for verbal vaccine risk/benefit communication. When this study was conducted, the most recent available *Red Book* (1997) contained only 2 sentences endorsing the need to inform parents and to encourage parent questions. After completion of this study, a more recent *Red Book* has been released (2000). This newest *Red Book*¹⁶ has included a section on risk communication that helps providers anticipate questions and recommends nonjudgmental approaches to exploring parents' health knowledge and beliefs. It restates the law by stating that the VIS should be given with every vaccine dose. It facilitates this by referring providers to several resources to easily obtain the VIS. The law itself focuses on vaccine information materials and says that the information shall be presented in understandable terms, including a description of the risks and benefits and the availability of the National Vaccine Immunization Compensation Program. With the current wording of the law and the *Red Book* discussion, the exact content of risk/benefit communication is not explicit. Rather, the content is only implied by the content of the VIS. Neither the law nor the *Red Book* states who should discuss risk, whether the person must be a physician, or whether a health care extender might provide the service. We could find no research or recommendations about how vaccine risk/benefit communication might be performed in a timely manner or to maximize parent comprehension and satisfaction.

Risk/benefit communication is a skill that can be taught. In the current health care environment, it is important for both physicians and nurses to have this skill. Medical and nursing students, residents, and practicing providers need strategies and practical training to deliver understandable risk communication in a timely manner. The federal mandate and the recommendations of the American Academy of Pediatrics for specific content of risk/benefit communication need to be stated more clearly and be made easily available to busy practitioners.

Although physicians indicated that they had only a moderate amount of training in communicating risks and benefits (5.4 on 10-point scale), they did not express very much interest in short, interesting training on the topic (6.0 of 10). Nurses expressed significantly more interest (7.7 of 10). The overriding importance of time indicated to us that any new immunization risk/benefit protocols need to maximize time efficiency and minimize duplication and time demand.

Providers were also asked how they liked to learn. The number one choice for all providers was for practical materials/articles (80%). We did not ask specifically what practical materials providers wanted. Preferences for other learning methods varied significantly by provider.

Despite government agency interest in new technologies such as satellite television conferences and the Internet to disseminate up-to-date information

concerning vaccines, our survey revealed that practicing physicians do not like television conferences and few nurses or doctors requested computer or Internet materials. The focus groups and survey indicated that busy private practitioners strongly preferred ready-to-use practical materials.

Limitations

The results of this study represent self-reports by board-certified academy member physicians and their office nurses working in private practices that provide childhood immunizations. We did not verify independently actual clinical practice of risk/benefit communication. There is the possibility that response bias played a role in these results because those with a particular perspective or practice pattern may have been more or less likely to respond to the survey. Our survey did not include physicians who were not active members in the American Academy of Pediatrics or the American Academy of Family Physicians. The precision of prevalence estimates produced by our study is limited by sample size. We were willing to accept these limitations, however, because our study was conducted as a first-look at risk/benefit communication best practices.

Because of this, the VIS distribution rates reported here may represent a best case scenario of self-reported compliance with the 1986 National Childhood Vaccine Injury Act.¹ The VIS distribution rate may be lower or higher, in fact, than that measured here. Our survey sample did not include parents and our study was not designed to measure VIS distribution at the level of the parent encounter.

Most Important Things We Learned

In general, our findings suggest that there may be a mismatch between legal mandates for risk/benefit communication, providers' perception of what parents needed to know, and actual provider vaccine risk/benefit communication practices. Although the current law states that the VIS must be given before every dose of vaccine and almost all (97%) providers believed that parents needed information on immunizations, 1 in 3 indicated that such distribution was not the practice in their offices. Time was listed as the greatest barrier to vaccine risk/benefit communication especially by family physicians. Physicians did not perceive any inadequacies in their knowledge or skills as barriers to vaccine risk/benefit communication and indicated only moderate interest in training to improve their skills. Nurses reported more training and indicated higher interest in continued training in vaccine risk/benefit communication. The doctor and nurse function as an immunization team but seem to lack coordination for risk/benefit communication.

Implications for Intervention

Efforts to improve risk/benefit communication in private practice offices should enhance the immunization team that already exists in these offices through a systems approach to both nurses and physicians. Practical interventions and new policy developments need to be aimed at the office immunization

system. Office-based materials needed may include a preimmunization booklet for parents, screening sheets for contraindications, and a poster about immunization facts for reference for providers. Some physicians may also need a prompt to remind them to discuss vaccine risk/benefits with parents. Physicians and nurses in private practice generally preferred practical materials/articles, and few requested interactive computer programs as learning tools for themselves or their patients. Physicians should be encouraged to obtain additional training and to enable their nurses to do the same. Such training in vaccine risk/benefit communication needs to focus on the entire office system (even if only one provider attends the conference). Academy and CDC vaccine communication training/continuing education should contain clear recommendations for vaccine risk/benefit communication, specifying who is required to give the information and how the office might work together to provide such information. Practical materials that prompt the entire office to inform patients are needed.

Our study demonstrated the reality that physicians want and believe that they need to communicate to parents many aspects of vaccine risks and benefits. However, under current time constraints, this is not viewed as practical. Today, during each well-child visit, the physician is faced with the dilemma of providing parent education for an increasing number of complex issues in a limited period of time. Until patient education is viewed as "billable" time, it is likely that vaccine risk/benefit communication will suffer, unless it can be streamlined using new materials or delegated to appropriately trained support staff. Practical materials would also help physicians and office personnel remain current on vaccine risk/benefit issues.

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