

Volume 94 No. 7 July 2011

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Medicine & Health RHODE ISLAND

VOLUME 94 NO. 7 July 2011

PUBLICATION OF THE RHODE ISLAND MEDICAL SOCIETY

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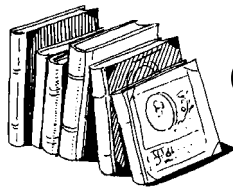
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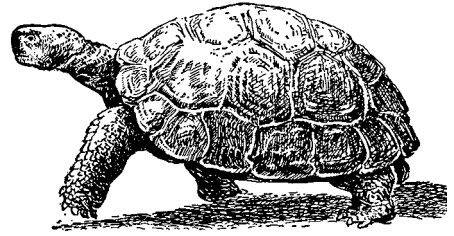
Medicine and Health/Rhode Island (USPS 464-820), a monthly publication, is owned and published by the Rhode Island Medical Society, 235 Promenade St., Suite 500, Providence, RI 02908, Phone: (401) 331-3207. Single copies \$5.00, individual subscriptions \$50.00 per year, and \$100 per year for institutional subscriptions. Published articles represent opinions of the authors and do not necessarily reflect the official policy of the Rhode Island Medical Society, unless clearly specified. Advertisements do not imply sponsorship or endorsement by the Rhode Island Medical Society. Periodicals postage paid at Providence, Rhode Island. ISSN 1086-5462. POSTMASTER: Send address changes to *Medicine and Health/Rhode Island*, 235 Promenade St., Suite 500, Providence, RI 02908. Classified Information: Cheryl Turcotte/Rhode Island Medical Society, phone: (401) 331-3207, fax: (401) 751-8050, e-mail: cturcotte@rimed.org. Information on permissions and reprints available from jdttee@rimed.org.

Note: *Medicine & Health/Rhode Island* appears on www.rimed.org, under Publications.



Commentaries

Getting Older



Having reached the age where my patients have begun telling me, “you look good, Doc;” a secretary remarking, “I hope I have your energy when I get to be your age;” or a patient asking, “Who should I see when you retire or something happens to you?” I’ve begun worrying myself about all the things my patients do.

Many years ago one of my patients, a very verbal, vivacious, mildly retarded woman, asked, in response to my not being able to recall what I wanted to tell her, “So you’ve got CRS, too!”

“CRS?” I asked.

“Can’t remember sh___.”

“I guess I do,” I answered.

For a very long time I’ve told patients that I’d give them something at the end of the visit, a leaflet about an organization, a referral for therapy, or something similar, and then forget at the end of the visit. So, the fact that I continue to do this hasn’t bothered me, but recently I visited another medical center where I talked to the movement disorders group, but was professionally friendly with some other department members as well. Yet I failed to recognize them when I passed them in the corridors. That wouldn’t be so bad except they recognized me. It’s not only embarrassing, but once we reach a certain age, it becomes worrisome. One interpretation for this is that I was in an unfamiliar place and assumed everything was unfamiliar, whereas I stood out to the people who worked there regularly. Alternatively I simply forgot faces. As Sherlock Holmes was wont to remark, the memory holds only so much information. One must discard that which is less important. I don’t have that much stored, and I’m hopefully not that kind of person.

Not long ago a student asked a question about a neurological syndrome, and specifically about a paper I had written over twenty years ago. I did recall that paper, and, equally importantly, what it said, but when I offered to find her a recent review article, and couldn’t come up with one, I

decided to print an article from an electronic neurology textbook, which I knew was updated each year. I discovered, both to my simultaneous horror and pleasure, that the chapter was my own. I simply had failed to recall that I had updated this article within the past few months. And since there was no co-author I had no one to blame. My initial reaction to seeing my name as the author of the chapter was pleasing. I had been writing so much that I didn’t recall something. This quickly was replaced by concern. I had not, in fact, written so much that I shouldn’t remember all the things I’ve written. There are some doctor research-authors who have, in fact, “written more than they’ve read.” Some organizations have professional writers who write articles for the doctors, or at least, used to. Ghost authorship is now banned by most medical journals, but the ghost authors are now listed as the second or third authors, where, in fact, they had actually written the whole thing. The first author goes first because he’s a VIP, and the justification is that the work was all her/his ideas anyway. And maybe she/he had discussed it with the actual author. Well, I don’t have such help. So, I simply didn’t recall updating this manuscript. In fact, I had written the bulk of it many years ago, but I did reread it and update it each year.

I don’t remember faces. I see patients and can’t recall that I’ve seen them before. But not just that. Sometimes I’ve been seeing them for quite some time. Several years ago I stopped asking the ones I did remember why the spouse wasn’t with them at this visit, having learned, more than once, that the spouse had died a few years before, and that I had been told this before. I try to enter this information in my notes, so I don’t make the same faux pas again.

Yet I don’t forget that a particular patient had a particular tic, or a peculiar tremor, or a psychogenic movement disorder, although I sometimes forget the whole patient. I don’t get lost much more when driving than I used to.

I worry that I’ll practice medicine the way my patients drive, insisting that their driving skills haven’t suffered a bit despite being 83, having severe Parkinsons’ disease and some visual impairment. “I’ve been driving for 65 years and haven’t had an accident yet!”

The tests required for continued licensing, given every 10 years, are intended, objectively, to make sure that I’m up to date, and hopefully, not yet demented. But I’m grandfathered in so I don’t have to take the test. Of course I *could* take the test voluntarily, but I’m a subspecialist. I don’t see patients who don’t have movement disorders. I try to keep up to date on the other neurological problems, but I don’t need to, so if I’m not up to date on MS or headaches, why should I stop seeing patients with movement disorders? At least that’s what I tell myself.

Houston Merritt, the great neurologist of the twentieth century, used to say, “when patients tell you their problem can’t be psychogenic, it probably is and when they tell you it is probably stress-related, it probably isn’t.” So maybe my fear is exaggerated. Most of my patients who report memory problems don’t really have them but, unfortunately, some do.

Who doesn’t forget stuff? I sometimes try to reassure those patients who I don’t think have a true problem with the observation I once saw on the back of a sweatshirt of a participant in the New York City marathon many years ago, “the older I get, the better I was.” My memory was never so hot.

— JOSEPH H. FRIEDMAN, MD

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The Myth of Privacy

There is, of course, a notable difference between privacy and secrecy despite their interchangeable usage. Privacy is that form of seclusion or retirement that ensures some measure of personal separation from outside intrusion. It is, frequently, a voluntarily chosen status. The word derives from the Latin, *privatus*, meaning apart from the state, deprived of public office or of belonging, not to the state, but to one's self. Privacy is a freedom which decries public exposure or disclosure. Secrecy, on the other hand, is that condition whereby something is hidden or concealed. It comes from the Latin, *secretus*, meaning to set apart, to separate, to hide.

Privacy pertains more to the individual person, and in some climates and cultures is valued as a fundamental human right. Secrecy pertains more to things such as documents or past events; secrets can exist independent of the persons bearing – or baring – them. And thus many of the immortal proclamations and declarations of human rights indicate the fundamental character, indeed necessity, of privacy; but never do these documents talk of secrecy as a natural or divinely ordained privilege.

Private things are intensely personal and human-oriented. Contractual affairs are more private than secret; while espionage and felonies are inevitably more secret than private. Private things are intensely, idiosyncratically personal; secret things are notable by the efficiency to which they are physically hidden. A private dinner party suggests a celebratory gathering; a secret dinner party, on the other hand, hints of clandestine planning.

Surely, there is much overlap in the meanings and uses of the two words, secrecy and privacy. And while these almost-synonyms possess shared meanings, can there also be occasions in which they are in conflict with each other? Can legislation pertaining to secrecy be a threat to the privacy of individuals? And further, have the tools and technical resources of the digital age reduced the illusion of privacy to a mere myth?

A decade ago, only banks routinely employed surveillance cameras. Now such devices are common in a wide variety of commercial settings as well as at urban street intersections, highways, bridges, tunnels and airports. Each telephone call, innocent or nefarious, now leaves a permanent trail in some indestructible computer. Indeed, each call routinely announces the identity of the caller before a word is uttered. The older cinematic scene of a sweating police officer exclaiming: "Can we trace that call?" elicits only laughter today. A generation ago, Americans feared an invasion by extra-terrestrial creatures, Martians perhaps. The intruders are no longer aliens: the trespassers are ourselves. Only an anchorite secluded in a Nepalese cave might now feel reasonably free of covert observation.

The means by which the integrity of individual privacy may be transgressed is fully developed, fully operative; and the illusion of continued privacy has therefore become dependent upon the benevolence, if not the intentional laxity, of one's government and its operative agencies.

The attack upon privacy is thought to arise principally from nameless and evil governmental operatives. But there is a human trait called curiosity which is more than mere innocent wonderment about the dynamics of nature. Certainly curiosity is one of the most indestructible characteristics of the human mind. Without curiosity, science would still be in its infancy. But there is another face of curiosity that demands information about the intimate lives of humans, an insatiable nosiness about the private affairs of others, particularly those others who have risen about the anonymous masses, people of notoriety or fame in government or the entertainment business.

And thus an entire industry has arisen fed by the collective human desire for intimate information about others. It has given rise to a transnational intellectual currency called informed gossip, a currency that underwrites a major segment of the newspaper and magazine industry. It respects no privacy, no privileged status, whether it be a budding actress from Missouri, a prime minister from Italy or even a presidential aspirant in the United States.

The Scriptures have informed us: "Be not curious in unnecessary matters: for more things are shewed unto thee than most men understand."

Dorothy Sayers (1893 – 1957), whose mystery stories always baffled us but, in their final chapters, never left us mystified, once said:

As I grow older and older,
And totter towards the tomb,
I find that I care less and less
Who goes to bed with whom.

– STANLEY M. ARONSON, MD

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Disclosure of Financial Interests

Stanley M. Aronson, MD, and spouse/significant other have no financial interests to disclose.

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Introduction: A View of Rhode Island Pediatrics

Elizabeth B. Lange, MD FAAP

In her keynote address at the American Academy of Pediatrics' national convention in October 2009, Mrs. Alma Powell, chair of the America's Promise Alliance said that "pediatricians are experts at our national security and economic development because they feel the moral imperative of ensuring the well being of our children." This statement surely embodies the Rhode Island pediatrician. Including resident trainees, Rhode Island boasts over three hundred men and women who, collectively, have hundreds and hundreds of years of experience proudly caring for our state's children.

We are living in crucial but exciting times. Federally the talk is about healthcare reform. Locally the talk is about the Global Medicaid Waiver. However, both of these discussions are about health insurance reform. True cost savings will only be achieved with an unrelenting laser focus on healthy care reform, and healthy care for all children. It is globally embarrassing that the richest nation in the world does not provide comprehensive health services to all of her children. As the saying goes, "an ounce of prevention is worth a pound of cure." And since our patients are measured in pounds and ounces, pediatricians know the value of healthy care very well.

The Medical Home was a concept born by the **American Academy of Pediatrics (AAP)** in 1967 as a best-practices method to coordinate the medical care of children with special health care needs.¹ In recent years, the definition of the medical home has been broadened to become the Patient Centered Medical Home, resulting in a document of standard principles that are endorsed by four leading national organizations—the American Academy of Pediatrics, the American Academy of Family Physicians, the American College of Physicians and the American Osteopathic Association.² While it may be intuitive that access to a personal physician improves health and saves health care dollars, the proof is available here in Rhode Island.

By increasing family access to a medical home, the financial investments in our state's RItE Care insurance program have been returned with both short and long term healthcare cost-savings as well as healthier patients. According to the RI KIDS COUNT, children and adults enrolled in RItE Care have the lowest percentage of emergency admissions to the hospital, lowest rates of preventable admissions, improved access to primary care and healthier infants and children. Pregnant women who are insured by RItE Care have healthier pregnancies, fewer infant deaths and are less likely to smoke.³ In a medical home, children have a personal pediatrician. They have regular check ups where their vision and hearing are screened, their development and schooling are assessed, their parents receive anticipatory guidance about the child's development and the child receives his/her vaccinations. The AAP calls these the "entals"—mental, dental

and developmental. This comprehensive approach to well child care is the standard of care as codified by the AAP document Bright Futures.⁴ Written in the healthcare reform legislation as the best standard of medical care for pediatric health, Bright Futures is now the law of the land. As a thorough document for ideal pediatric well child visits, the Bright Futures standards add to each office visit time consuming but worthy screenings and discussions that are valued by **Current Procedural Terminology (CPT)** codes. Recognizing the cost savings component of Bright Futures-driven care, insurance companies should value this care with payment of at least 100% Medicare for these screenings and their codes. Smaller patients should not equate to smaller payments.

**This study shows
a direct and at
times exponential
correlation between
a higher ACE score
and health related
behaviors.**

As previously stated, insured children in a medical home are healthier and are more likely to grow in to healthier and productive adults who require less healthcare dollars over their lifetime. The ongoing research of the CDC's **Adverse Childhood Events (ACE)** study⁵ is a poignant reminder that a healthy childhood has lifelong value. Here is the compelling scientific proof that many chronic diseases of adults are determined decades earlier by childhood experiences. In the study adults were asked questions about their childhood—were your parents divorced

or separated, were you abused, either emotionally, physically or sexually, were you neglected, either emotionally or physically, was there domestic violence in the home or mental illness, etc. Each affirmative answer was scored one point with the total number of points equally the ACE score. With just a score of two, and many adults have an ACE score of two, there is five-fold increase risk of suicide attempts and a two-fold increase in chronic depression in women. Extrapolated to the general female population, the ACE study shows that 54% of current depression and 58% of suicide attempts can be attributed to adverse childhood experiences. This study shows a direct and at times exponential correlation between a higher ACE score and health related behaviors. It is a stunning piece of research that proves that our society pays in the future for the experiences of today. Childhood events clearly affect adult lives and these effects cost big healthcare dollars.

These economic times are challenging but we cannot turn our back on the fact that the policy and payment decisions that we make right now can affect our children for a lifetime, and will affect our nation for a generation. But there is hope. The best inoculation that we can give to our children for a successful future is to guarantee that every Rhode Island child realizes the five promises of America's Promise.⁶ In this paradigm, children need access to caring adults, safe places, a healthy start, an effective education and opportunities to help others. Currently, less than one in three US children receives enough of these five

promises to become independent, successful adults. The key factor to achieving this success is health.

As Mrs. Powell closed her keynote address in October 2009, she relayed the following story. In the Maasai culture, when the adults greet each other they say, “and how are the children?” Together, let us think of Rhode Island’s children with every decision we make and every action we take, each and every day, striving for that day when we can answer, “and the children are well.”

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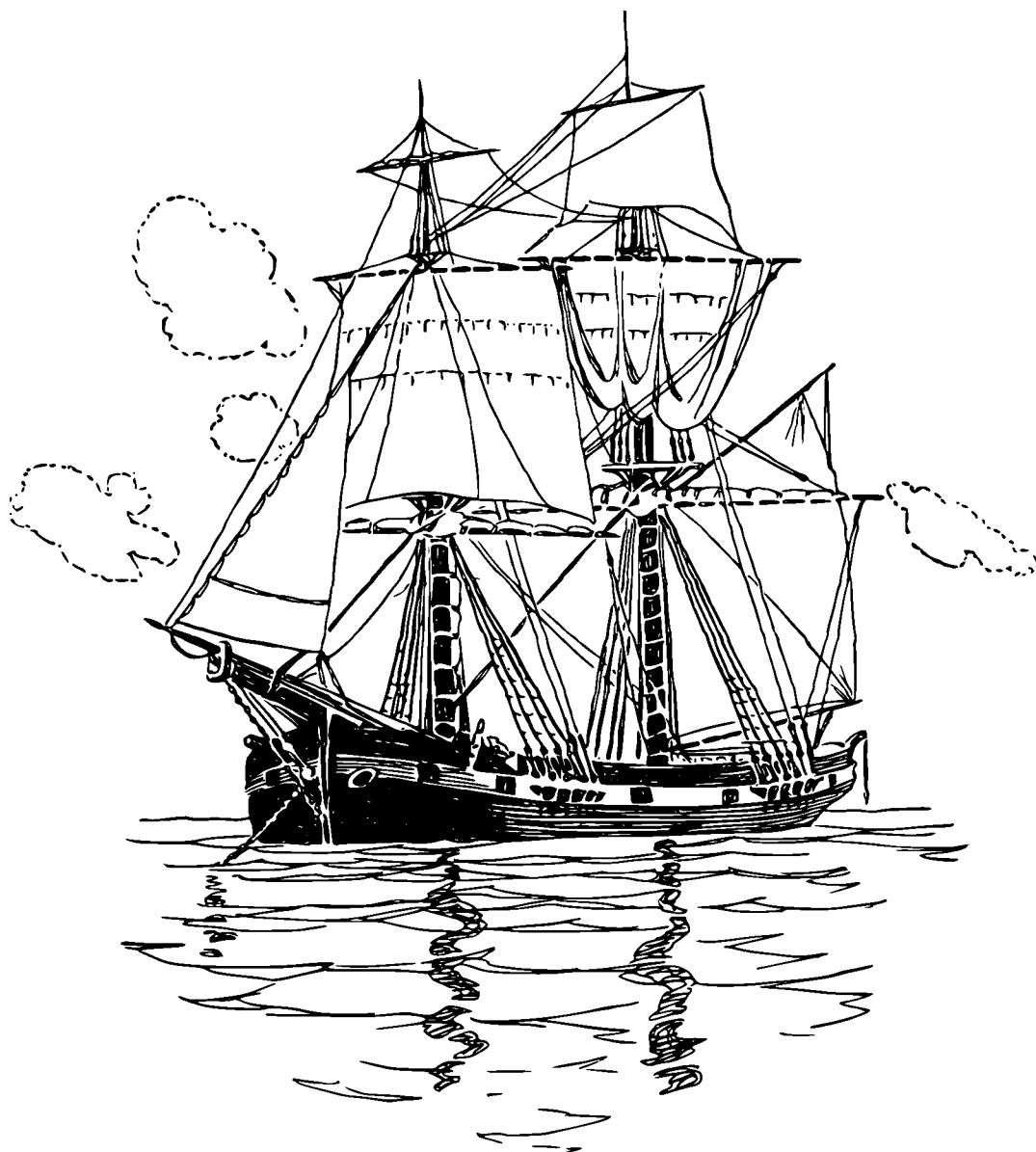
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Disclosure of Financial Interests

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Developmental Screening in a Pediatric Care Practice

Edward McGookin, MD, FAAP, and Viren D'Sa, MD, FAAP

In 2006, the American Academy of Pediatrics (AAP) formally recommended the use of developmental surveillance at each well child visit and the use of standardized developmental screening tools at nine, 18, and 30 (or 24) month visits.¹ In 2007 the AAP recommended the incorporation of an autism-specific screening at the 18 and 24-month visits.² In 2006 the Rhode Island Department of Health conducted a survey of 241 primary care pediatricians to better understand the current pediatric practice related to developmental surveillance and screening, identify barriers to developmental screening and assess the interest in training and support regarding developmental screening. All of the respondents indicated that they were providing developmental surveillance for their patients less than five years of age, largely using questions during the course of the exam or using surveillance checklists. At that time only 21.8% were using a standardized screening tool and the most widely used tool was the Denver Developmental Screening Test II.³ The most commonly cited barriers to developmental screening in the office setting were time limitations (76%), lack of staff (47%), and inadequate reimbursement (41%).³ All respondents indicated that they were somewhat or very familiar with supports and services for children with developmental risks or delays, 43.6% indicated that these services were adequate and those considered most lacking were supports for behavioral or mental problems and the availability of specialty evaluation following a failed screening.³

In 2007, a pediatric primary care office implemented a developmental screening program according to the recommendations of the 2006 AAP guidelines. Three months after the implementation of the screening program, a quality improvement study was conducted to determine physician responses to the results of the developmental screening program and to identify barriers to that process within the practice.

METHODS

Setting

The study site, a private-practice pediatric primary care office, implemented developmental screening using **Parents' Evaluation of Developmental Status (PEDS)** and **Modified Checklist for Autism in Toddlers (M-CHAT)** screening tools. The practice consisted of six board certified general pediatricians (three male, three female) and two pediatric nurse practitioners (female) serving approximately 12,000 children. The experience of the physicians involved in the study ranged from seven to 25 years post-residency training with a mean of 13 years. Review of insurance status revealed that 82% of children in the practice were covered by commercial insurance plans, 11% were covered by commercial managed care, and 7% were covered by a state administered health care plan. The study received institutional review board approval.

Screening Tools

The PEDS is a parent-completed interview form designed to screen for developmental and behavioral problems and indicate the need for further evaluation.⁴ One or more predictive concerns, Path A or Path B, on the PEDS constitutes a failed screen. Paths C, D, and E are designated as passed screenings. The M-CHAT is a parent-completed questionnaire designed to identify children at risk for autism.⁵ Two or more critical items or any combination of three or more items answered incorrectly constitutes a failed screen.

Procedures and Participants

To accommodate the AAP recommendations for developmental screening while creating a screening practice that was feasible in a busy office setting, the PEDS was administered to all children at the nine, 15, and 24-month well child examinations while the M-CHAT screening tool was administered at the 18 and 24-month examinations. This protocol was adopted to assure that there were a minimum number of visits at which two screens were administered. The Medical Assistant gave the screening tools to parents at the time of the visit. Parents were asked to complete the forms prior to the arrival of the **primary care pediatrician (PCP)**. The PCP reviewed the parents' responses, scored the screening tools and discussed the results of the screens with the parents. The decision as to referrals was left to the discretion of the PCP. The results of screening and dispositions of referrals were recorded in the **electronic health record (EHR)** and the original screening document was scanned into the patient's record.

Children who had developmental delays identified prior to their initial screening were excluded from the study, but children with other pre-existing medical conditions were included. Prior to the retrospective record review, the principal investigator confirmed that the scoring used by the PCP's followed PEDS and M-CHAT recommendations, that the PCP's understood the PEDS definition of "predictive concerns" and the protocol for referring children for

Table 1. Physician responses to failed screening
(Children screened with PEDS = 385. Children screened with M-CHAT = 207)

Test	PEDS – Path A	PEDS – Path B	M-CHAT
Patients	20	67	10
Referred	14	16	6
Deferred	6	51	4
Diagnosed with Developmental Delay	13	8	5
Parents refused evaluation	0	7	1

Path A = two or more predictive concerns. Path B = one predictive concern

Deferred - a referral for a diagnostic evaluation was not made.

Referred - a referral for a diagnostic evaluation was made

Table 2. Physician survey responses

Please indicate which barriers you have experienced in the provision of routine developmental screening.		Number of physicians responding affirmatively			
Time limitations in current practice		3			
Lack of medical office staff to perform screening		1			
Lack of treatment options for positive screening results		1			
Lack of knowledge regarding referral options for positive screening results		1			
Lack of confidence in validity of screening instruments		2			
Belief that clinical experience and observations are equally as effective as formal screening		2			
		Number of physicians responding affirmatively			
How do you typically deal with patients with two or more predictive concerns on PEDS screening?		Path A	Path B	Path C	M-CHAT
Review answers with the parent during the visit to clarify responses.		6	6	6	5
Re-administer screening at the next visit.		1	1	2	1
Refer patient for diagnostic developmental testing/evaluation		6	3	1	3
Have patient return for developmental surveillance before the next routinely scheduled visit.		5	5	3	1
Have patient return for developmental surveillance at the next routinely scheduled visit.		2	3	2	0
Administer the M-CHAT screening tool.		2	1	0	0

a diagnostic evaluation. All parents in the practice spoke fluent English.

Data Collection

A retrospective chart review was conducted by reviewing the EHR for the **current procedural terminology (CPT)** code 96110 that was used to bill for screening. The principal investigator reviewed the electronic charts of all patients identified by the billing code to confirm that the documented results matched those of the scanned screening questionnaires. The results were recorded as pass or fail and, when indicated, whether diagnostic developmental testing was recommended and/or performed on the basis of those results. If a child failed a screening and the physician elected not to refer for diagnostic evaluation, the outcome was recorded as deferred. If a child failed a screening and the physician referred the child for diagnostic evaluation, the outcome was recorded as referred. The results of diagnostic evaluation were recorded with the following designations: recommended but not obtained (due to parents not pursuing the recommended evaluation), obtained and passed, or obtained and developmental delay confirmed.

Analysis

Data were compared using descriptive statistics. The two-tail significance of the association between PEDS and M-CHAT

results was assessed with Fisher's exact test. Pearson product-moment correlation coefficient was used to further characterize any significant associations. P values of 0.05 or less were considered significant. SPSS 12 statistical application was used for analysis.

RESULTS

Four hundred eighty nine children were screened over the 12-month study period using either the PEDS for the risk of developmental delay or M-CHAT for the risk of **Autism Spectrum Disorder (ASD)**. (Table 1) The PEDS was administered to 385 children. 87 children (23%) failed the screening. Physicians deferred further testing in 57 (66%) of the children who failed. Of the 30 (34%) children who were referred for further testing, 21 (70%) were diagnosed with developmental delay, seven (23%) did not pursue the recommended evaluation and two (7%) were found to have no developmental concerns upon diagnostic developmental testing.

Two hundred nine M-CHATs were administered to 207 children. Two children received M-CHAT testing twice during the study period and both passed on each occasion. Ten children (5%) failed the screening. The PCP referred six children and deferred diagnostic evaluation in four of the ten children who failed the screening. The six who were referred had further developmental testing and were diagnosed with non-ASD developmental delay; five of

these children failed a previously or concurrently administered PEDS test and one did not have PEDS screening as developmental delay was diagnosed following the failed MCHAT at 18 months. Among the four children who were deferred, one passed the PEDS during the study period and three did not have PEDS testing during the study. Review of the medical records after the close of the study revealed that of these latter three, two passed MCHAT and PEDS screening at 24 months and the other one failed PEDS screening, but passed diagnostic developmental testing.

The expected concurrent administration of M-CHAT and PEDS screening was not observed in this study. There were also missed re-screening opportunities following a failed score on either PEDS or M-CHAT screens with 75% and 83% of children respectively not having such a re-screen during the study period. Most of the children referred for diagnostic developmental evaluations following a failed screen were diagnosed with developmental delays (93% Path A, 50% Path B). These figures may be under-representations since seven of the 16 referred children on Path B did not complete developmental assessments and some may have been ultimately diagnosed with developmental disorders.

A survey of the participating PCP's was conducted to determine the attitudes and perceptions of the developmental screening process. (Table 2) Of the six respondents,

two worked full time and four worked part-time (0.75 full-time equivalent). The full time PCP's saw an average of 40 well visits per week and the part-time PCP's saw an average of 35 well visits per week. Of the six physicians, the most commonly cited barriers to developmental screening in the office setting were time limitations (three), lack of confidence in the screening instrument (two), belief that clinical observation is as effective as screening (two), and lack of staff, lack of treatment options, and lack of knowledge of referral options each noted by one of the respondents. Physicians indicated that they refer 65-99% of patients who had two or more predictive concerns on the PEDS (Path A). The observed rate of referral was 70%. The estimated rate of referral for patients with one predictive concern (Path B) was 25-65% and the observed rate was 24%. Five of the 6 physicians (83%) indicated that they felt that the current screening practice reliably identifies children at risk for developmental delay.

DISCUSSION

This retrospective study revealed that while the PEDS and M-CHAT can be routinely used in a busy private-practice, clinicians did not strictly adhere to the referral criteria for the screening tools. Survey results suggest that the observed rate of deferrals may indicate a reliance on clinical impressions and judgment and lack of confidence in the screening instruments when making referral decisions. The rates of developmental delay observed in children who failed the PEDS, particularly with two or more predictive concerns (Path A), underscore the importance of referring those children for developmental testing. Previous studies have shown that most (71%) pediatricians used clinical surveillance to identify children with developmental delays that need a diagnostic developmental evaluation.⁶ A feasibility study done with a large Pacific Northwest medical group reported a dramatic increase in referrals with the introduction of a standardized developmental screening instrument.⁷ In contrast, our results are similar to those experienced in a large urban community clinic that did not experience an increased referral rate with the introduction of the PEDS suggesting that clinical judgment was a critical factor in determining outcome.⁸

Following the publication of the 2006 recommendations, the AAP launched a pi-

lot project to implement these recommendations in 17 diverse pediatric practices. The project investigators concluded that most practices were unable or unwilling to adhere to the three specific recommendations of the AAP guidelines; to implement a 30 month visit; to administer a screen after surveillance suggested concern; and to submit simultaneous referrals both to medical subspecialists and local early intervention programs for children who failed office based screening.⁹

This observational study concerned with the physician responses to the results of the PEDS and MCHAT screens has several important limitations. It was a retrospective study design and had a small sample size. Outcomes among children who passed the screenings were not recorded, as doing so would be a reflection of the psychometric properties of the screens. These screening tools have well-established sensitivity, specificity, and validity and challenging these properties was not the intended focus of this study. We were unable to determine the number of children who were eligible for screening but did not receive that screening. If these numbers of missed screening opportunities were large, they could have a significant impact on the outcome data.

Despite these limitations, this study illustrated some important information regarding primary care physicians' responses to developmental screening in a busy primary care setting. Clinicians did not strictly adhere to the referral criteria indicated by the screening tools employed. While the psychometric properties of these developmental screening tools and the value of clinical judgment are not in question, there clearly are factors contributing to poor adherence of practitioners to recommended screening and referral guidelines.

Acknowledgments

The authors would like to acknowledge the contribution of the physicians and staff of Coastal Waterman Pediatrics in the implementation and support of the developmental screening process and Mary Roberts for the statistical analysis of the study data.

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Disclosure of Financial Interests

The authors and/or their spouses/significant others have no financial interests to disclose.

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Early Identification of Eating Disorders in Primary Care Pediatrics

Diane DerMarderosian, MD, FAAP, and Allison Hall, LICSW

Food, nutrition and exercise are integral facets of our culture. At one point in their lives, most Americans have started a diet, attempted to change eating habits, gained or lost a few pounds and/or implemented a new exercise regimen in response to either their own or others' concerns about weight. These behaviors are often medically beneficial interventions that lead to a healthier and improved sense of self. For some individuals, however, thoughts and behaviors related to food, health and body become distorted, destructive and potentially fatal. At times, the margins between healthy and unhealthy cognitions and behaviors can be difficult to distinguish.

Identifying individuals at risk for developing an eating disorder can be challenging, however research highlights characteristics placing those at higher risk. The pathogenesis of eating disorders is multifactorial, with individual, family, cultural and genetic/biochemical conditions all playing a role. Evidence demonstrates that several psychiatric issues (including depression, obsessive-compulsive disorder and addictions) are more prevalent in patients with eating disorders.¹ Other risk factors include a family history of an eating disorder and a history of abuse. Of note, dieting has been found to be a proximal risk factor for developing disordered eating and eating disorders.² It is felt that some individuals are genetically/biochemically predisposed, and when combined with other factors such as cultural, psychological, environmental and family related issues, an eating disorder may result. The exact mechanism for the way in which genetic factors influence risk is not completely understood. However, there is evidence that the genetic effects may be "activated" by puberty.³ Neuroendocrine abnormalities are also being explored, including the role of Leptin, a hormone which is produced in adipose tissue.⁴

Research has revealed a steady increase in the rates of eating disorders in children and adolescents since the 1950s.⁵ Of note, studies demonstrate that more than 50% of children and adolescents with

Eating disorders do not meet **Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)** criteria for Anorexia nervosa or Bulimia nervosa. Although a revision of diagnostic criteria for DSM-V has been proposed with a specific focus on younger patients,⁶ at current these patients are often referred to as having partial syndromes or **Eating Disorder, Not Otherwise Specified (EDNOS)**.

**Eating disorders
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Children and
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There has been increasing prevalence in younger age groups, with males representing much higher numbers (about half) in patients 13 years and younger.¹ These younger patients can present diagnostic challenges as they may not report body dissatisfaction. In addition, nutritional compromise may manifest itself as growth failure or minimal forward movement during a period of expected growth, rather than significant weight loss. Female patients may not have experienced menarche at onset of illness,⁷ making the cessation of menses an irrelevant criterion.

Eating disorders are prevalent in modern society, with serious, potentially fatal, consequences.¹ In fact, Anorexia nervosa is associated with the highest mortality rate of any psychiatric disorder in the DSM-IV.¹ Some potentially life-threatening medical sequelae are difficult to detect with testing. Many patients who die from medical issues related to their eating disorders can have normal labs and studies. Of note, suicide attempts and

completed suicides are relatively common, especially for patients with bingeing and/or purging behaviors. A delay in appropriate treatment is associated with medical, psychological and social complications, which may not be reversible.

Because early diagnosis and multidisciplinary treatment results in better outcomes, it is crucial to recognize that these behaviors and patterns require treatment even if an individual denies them or minimizes their significance. Therefore routine screening by **Primary Medical Doctors (PMDs)** is essential and should be performed in the context of all pre-teen and adolescent annual health supervision and sports clearance visits. It is important for medical providers to remain vigilant to signs and symptoms indicative of disordered eating such as primary or secondary amenorrhea. Routine monitoring of height, weight and BMI longitudinally on growth charts helps identify concerning trends, even if weight loss is absent.¹ The Bright Futures guidelines and/or the SCOFF questionnaire can provide a helpful framework for this screening.⁸ If concerns arise in any of these areas, additional assessment and close monitoring are indicated.

Further assessment can occur in the primary care setting, or by referring to appropriate medical subspecialists and mental health providers. This assessment includes establishing the specific psychiatric diagnosis and co-morbidity, evaluating medical and nutritional status including level of risk. Performing an initial psychosocial evaluation including thoughts, feelings and functioning is essential.¹ A safety assessment should also be a part of this evaluation. Obtaining a collateral history from parents or other support people is imperative because individuals with eating disorders often have perceptions of health, body, and food that are not reality based. A comprehensive medical and nutritional history, physical exam, and selected laboratory tests are performed to clarify the diagnosis, determine severity, and guide treatment.

A comprehensive history includes questions about highest and lowest weight, desired weight, perceived healthy weight, exercise history including how patient feels on days she/he can't exer-

cise. In addition, a diet history including intake, portion sizes, food restrictions, picky eating, ritualized eating habits, calorie/fat/carbohydrate counting, and amounts of non-caloric fluid intake is es-

sential. Exploring binge/purging history (including vomiting, laxative use, diuretic use, ipecac use, over-exercise), anabolic steroid use, stimulant or other drug use, menstrual history, elimination history, and physical/sexual abuse history is necessary. A family history should include asking about obesity, eating disorders, depression, other mental illness, and substance abuse.¹

A complete **review of symptoms (ROS)** is obtained to determine the presence of symptoms associated with malnutrition, vomiting or other medical causes of weight loss. Physical exam findings sometimes found in patients with eating disorders are listed in Table 1. The differential diagnosis (Table 2) is extensive and should be explored thoroughly to diagnose and treat the patient appropriately. This includes consideration for a co-morbid medical and/or psychiatric diagnosis. Key medical populations to consider are those with Type 1 Diabetes mellitus, thyroid disease and Inflammatory Bowel Disease.

Eating disorders can affect every organ system. Children and adolescents are at particular risk due to their active phase of growth and development. Medical complications associated with eating disorders can be caused by malnutrition, binge/purging behaviors, or refeeding. A full screening should be performed with the understanding that normal laboratory values don't exclude medical instability or serious illness. Initial assessment includes a CBC, Chem 10, LFTs, UA, Thyroid function tests, ESR, total IgA and TTG. An EKG is completed. In patients with amenorrhea, a pregnancy test, LH, FSH, estradiol, and prolactin should be performed. Other testing including radiological tests (CT, MRI, upper/lower GI system studies) should be performed if clinically indicated. In boys, a free and total testosterone is done. A bone density study is recommended in girls with amenorrhea for more than six months or in boys with severe malnutrition, acute weight loss or low testosterone. Low levels can be associated with nutritional compromise.

If medical complications are identified, they should be addressed immediately. The majority of medical complications resolve after judicious nutritional restoration, resolution of unhealthy eating behaviors and recovery from the eating

Table 1. Physical Exam Findings in Patients with Eating Disorders

Carotenemia
Edema
Hypothermia
Cold extremities/acrocyanosis
Russell sign (callous on knuckles from self-induced emesis)
Abrasions/bruising on spine from excessive exercise
Thinning hair
Dry skin
Lanugo
Atrophic breasts/atrophic vaginitis
Sialoadenitis
Angular stomatitis
Dental erosion
Palatal scratches
Flat/anxious affect
Delayed or interrupted puberty
Sinus Bradycardia
Other Cardiac Arrhythmias
Cardiac murmur
Orthostatic vital sign changes
Low blood pressure

Source: Physical Examination Findings Sometimes Seen in Children and Adolescents With Eating Disorders. (table) Rosen D. Identification and Management of Eating Disorders in Children and Adolescents. *Pediatrics*. 2010;126(6):1240-53.

Table 2. Differential Diagnosis of Eating Disorders

Endocrine

Hypothyroidism, Diabetes Mellitus, other endocrine disorders (hypopituitarism, Addison disease)

Gastrointestinal

Inflammatory Bowel Disease
Celiac Disease

Infectious Disease

Chronic Infections (HIV, tuberculosis, others)

Other Psychiatric Disorders

Obsessive Compulsive Disorder
Anxiety Disorders
Depression
Substance Abuse

Other Disorders

CNS Lesions (including malignancies)
Other Cancers
SMA Syndrome (Superior Mesenteric Artery Syndrome)

Source: Differential Diagnosis of Eating Disorders (table). Rosen D. Identification and Management of Eating Disorders in Children and Adolescents. *Pediatrics*. 2010;126(6):1240-53.

disorder. However, potentially irreversible medical effects include: growth retardation, loss of dental enamel in the context of chronic vomiting, structural brain changes, pubertal delay/arrest, and impaired acquisition of peak bone mass and subsequent increase in fracture risk.⁹

As part of the initial evaluation, it is important to determine the most appropriate level of care. In order for psychological interventions to be effective, medical stabilization and nutritional rehabilitation are imperative. If significant medical or nutritional compromise exist, an inpatient medical stay may be necessary. The Society for Adolescent Medicine recommendations for inpatient admission which include one or more of the following: severe malnutrition (weight < 75% IBW), dehydration, electrolyte disturbance, cardiac dysrhythmia, physiological instability (bradycardia with HR < 50 daytime and < 45 at night), hypotension (80/50 mm Hg), orthostatic changes in pulse, arrested growth and development, failure of outpatient treatment, uncontrollable bingeing and purging, acute medical complications of malnutrition, acute psychiatric emergencies, or co-morbid diagnoses that interfere with treatment.¹⁰

If an inpatient medical admission is required for stabilization, judicious refeeding is essential. This includes slow, progressive advancement of balanced nutrition including appropriate percentages of carbohydrate, protein and fat. Patients require close monitoring for evidence of refeeding syndrome, including frequent laboratory testing, as the refeeding process can precipitate significant abnormalities which require immediate treatment.¹

While most children and adolescents with eating disorders are treated in the outpatient setting, additional levels of care include medical inpatient, eating disorder inpatient, residential, partial hospitalization/day treatment and intensive outpatient treatment. Resources vary from area to area. Regardless of the level of care, early, multi-disciplinary treatment including nutritional, medical and mental health professionals is a cornerstone of successful treatment. Although individual and family based therapy can both positively impact short term outcomes, family based treatment has been found to be more effective in supporting longer term remission.¹¹

The prognosis of eating disorders in adolescents varies greatly in the literature. However, adolescent outcomes are significantly better than those reported in adults. While the illness course is often protracted, a majority of these patients recover medically and behaviorally from their eating disorders. Moreover, mortality rates are lower in adolescents than those in adults.¹²

Barriers to appropriate treatment which include inadequate insurance reimbursement and insufficient access to mental health care underscore the need for education and advocacy on the local and national level. Through advocacy for health care reform and otherwise, barriers to appropriate treatment such as inadequate insurance reimbursement and access to mental health care can be eliminated. Primary care providers play an invaluable role in preventing, diagnosing and treating eating disorders. Having a high index of suspicion, being familiar with the signs and symptoms of eating disorders and being knowledgeable of available treatments are critical for early diagnosis which leads to improved outcomes and is potentially life-saving. Moreover, primary care providers, based on their longstanding relationships with families, can provide vital support as these illnesses have a significant impact on all family members.

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Disclosure of Financial Interests

The authors and/or their spouses/significant others have no financial interests to disclose.

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Fostering Health: Health Care for Children and Youth in Foster Care

Carol Lewis, MD, FAAP, Jill Beckwith, MPH, Kristine Fortin, MD, FAAP, and Amy Goldberg, MD, FAAP

Children and adolescents placed into the foster care system have special health care needs. The physical and psychological consequences of abuse and neglect, as well as the trauma from being removed from their homes lead to physical, emotional and developmental problems. In addition, other risk factors associated with poor physical and mental health such as lack of medical care, poverty, homelessness, violence in the home, parental substance abuse, parental mental illness and premature birth, are often present and compound the child's health risk.¹

In 2010 in Rhode Island, there were 2,223 indicated investigations of child abuse and neglect involving 3,414 children. Among victims of child abuse and neglect in Rhode Island in 2010, 36% were age three and younger, 12% were ages four to five, 30% were ages six to 11, 15% were ages 12 to 15, and 7% were ages 16 and older. The vast majority (79%) of child maltreatment cases involved neglect. The greatest contributors to neglect are poverty, parental substance abuse and/or mental illness.²

As of December 31, 2010, there were 2,293 children under age 21 in the care of Rhode Island Department of Children, Youth and Families (DCYF) who were in out-of-home placement. Types of placements for these children varied, including 31% in non-relative/private agency foster care homes, 23% in relative foster homes, 13% in group homes, 12% in residential facilities, and approximately 2-5% in each of the following six settings: at the Rhode Island Training School, with relatives caring for children, in independent living/supervised apartment, in DCYF shelter care, in psychiatric/medical hospital/substance abuse treatment facility, or in other settings.²

Placement stability is a significant concern for children in foster care in Rhode Island and nationally. Changes in foster care placement jeopardize continuity of medical care and nurturing relationships. Placement instability has been associated with negative behavioral

and mental health outcomes.³ In **Federal Fiscal Year (FFY) 2010**, 14.1% of the 1,694 children who had been in out-of-home care for less than one year in Rhode Island had experienced three or more placements. Three or more placements were experienced by 35.4% of the 731 children who were in care between 12 and 24 months. Almost two-thirds (65.6%) of the 1,022 children who had been in care for two years or more experienced three or more placements. The percentage of children in the Rhode Island child welfare system who were reunified with their family of origin in less than 12 months from the time of removal from the home increased from 68% in FFY 2009 to 71% of children in FFY 2010 compared with the national standard of 76%.²

Medical Needs

The health and emotional needs of children in foster care are complex. The prevalence of chronic conditions among foster children has been estimated at between 30 and 80%.^{4,5} An estimated 25% of foster children have 3 or more chronic conditions.⁶ A disproportionate number of foster children are below the 5th percentile for height, weight and head circumference.^{4,6,8} Common medical problems for children in foster care include: respiratory problems (asthma and upper respiratory infections), allergic and infectious skin conditions, dental caries, pediculosis, anemia, delayed immunizations, and impaired vision and hearing.^{4,6,7-10}

At the time of placement children should be examined for signs of abuse and acute illness. The child's medical record should be obtained and the stability of chronic illnesses should be evaluated. Screening for developmental and mental health problems including suicidal ideation should be completed.⁸ Risk factors for vertically or **sexually transmitted infections (STIs)** also must be assessed. Routine testing for STIs should be completed because adolescents in foster care are more likely to engage in high-risk sexual behaviors when compared to adolescents not in care.¹¹

Cognitive Development

Developmental delay is exceedingly common among foster children.^{12,13} A varied and complex interplay of environmental and biological risk factors place foster children at high risk for developmental problems. Physical and emotional trauma associated with abuse, neglect, exposure to violence and lack of both a stable, nurturing caregiver and appropriate stimulation often characterize the foster child's environment of origin. Perinatal drug exposure, prematurity and nutritional deficiencies during the early critical period of brain growth adds to the biological fragility of this already high risk context.

SOCIAL-EMOTIONAL DEVELOPMENT

Children in foster care are at particularly high risk for mental health problems as a result of the stresses placed upon them by their home environment. Depression, reactive attachment disorders, acute stress responses, and post traumatic stress disorders are some of the common mental health diagnoses of children in foster care. Unmet emotional needs while living in abusive and/or neglectful home environments are then compounded by the trauma of removal from the only home that child has known. Addressing the multiple layers of emotional trauma for children in foster care is critical. Studies have shown that long term supportive and therapeutic relationships are essential for the emotional wellbeing of children in foster care and improve psychological outcomes. Children in foster care however, are often prescribed multiple psychotropic medicines in an attempt to alleviate symptoms often without an in depth assessment of the etiology of these symptoms.¹⁴

Barriers to Care

Multiple barriers interfere with meeting foster children's health care needs. Despite their high need for quality coordinated and comprehensive services, foster children remain underserved. A

1995 review of health services for children 36 months-of-age and younger in foster placement in New York, California and Pennsylvania found that less than half had all of their health care needs met and 19% and 32% had none or only some of the health care needs met respectively.¹⁵ Some of the factors that negatively impact a child receiving services include: young age, African American race, and placement instability. Placement instability, in particular for children in foster care, has also been shown to contribute to behavioral problems.¹⁰

Another barrier to optimal health care is a lack of information regarding foster children's medical histories^{6,8,16} including immunizations and screening.^{3,15} Barriers around sharing of health information between social services, physicians, foster parents, biological parents and children represent an additional challenge and can lead to miscommunication.^{8,9}

In summary, children and adolescents in foster care have more intensive service needs as compared to the general pediatric population or even other children who are poor. As children with special health care needs, children in foster care suffer from significant difficulties in getting the care that they need.

FOSTERING CONNECTIONS TO SUCCESS AND INCREASING ADOPTIONS ACT OF 2008

The Fostering Connections Law of 2008 is the most comprehensive federal legislation passed regarding the care of children and adolescents in foster care for more than a decade. This law recognizes that the health of children in foster care is a priority and that there must be up to date health records for children in care. The new law strengthens requirements that Rhode Island provide a plan to coordinate health services for children in foster care.

The law requires that Rhode Island develop a system for the ongoing oversight and coordination of health care services for children in foster care. Rhode Island must ensure the identification and response to these children's health care needs, including behavioral, mental and oral health and the coordination of those services. In addition, the plan, developed in consultation with medical experts, is to outline a schedule for initial

and follow up health screenings, address how health needs identified through screenings will be monitored and treated, describe how medical information will be updated and appropriately shared, discuss how health care will be continuously and collaboratively provided and address the monitoring of prescription medications.^{17, 18} The mandate is unfunded, but its inclusion and specificity in the Fostering Connections Act underscores the importance of health care for children in foster care.

In summary, children and adolescents in foster care have more intensive service needs as compared to the general pediatric population or even other children who are poor.

PRACTICE PARAMETERS FOR PRIMARY HEALTH CARE

The American Academy of Pediatrics (AAP) Task Force on Health Care of Children in Foster Care has defined standards of health care delivery and management to promote quality health care for children and adolescents in foster care since they require a more significant level of care by providers.⁸

The AAP Task Force on Health Care of Children in Foster Care has also defined national standards regarding the number of medical encounters and screenings that children and adolescents should receive while in foster care.⁸

- Health information gathering at the time of removal is an essential first step. This information should identify medical, developmental, and mental health conditions that will require ongoing therapy and identify health conditions that will affect the selection of foster placement.

- The first medical screen should occur within days by a medical provider experienced in the health care of foster children. This screen should occur within the first few days or at least within two weeks of removal. The purpose of this evaluation is to identify medical, developmental and health problems that need immediate attention and that might affect placement decisions.
- Health information gathering needs to continue. The collection of this health information should be more comprehensive and build on information already known about the child or adolescent. At a minimum, this information should include:
 - Names and contact information for caseworker and foster parents
 - Number, type and timeframe of out of home placements and any other previous Child Protection Program evaluations.
 - Immunizations
 - Allergies
 - Current medications
 - Prior hospitalizations, injuries and operations
 - Family medical history
 - Contact information of current and previous health care providers including sub-specialty care providers, Early Intervention, mental, behavioral health and oral health providers.
 - Medical problem list
 - Special educational needs
 - Name of schools attended
 - Individualized Educational Plan
 - Mental health history including past treatment plan and recommendations
 - Behavioral evaluations and treatment plans
 - Developmental assessments.
- Comprehensive Health Assessment at 30 days. This evaluation should be performed by a medical provider experienced in caring for

children and adolescents in foster care. This purpose of this evaluation is to evaluate in more depth the health, developmental and mental health needs of the child after the child has been in care. Gathered health information should be reviewed at this visit.

- Follow-up assessment at 60 days conducted by the same medical provider, is utilized to review results of treatment plans, assessments and review of coordination of services.
- Periodic preventive health care is recommended monthly for children in the first six months of life, every three months for children in the first two years of life and every six months for children over two. These visits are needed to ensure that all health needs are addressed and care is coordinated and communicated to the appropriate care providers.

Healthy Foster Care America is an organization initiated by the AAP and other partners to provide a resource for up-to-date recommendations and tools. This website is a highly recommended and useful tool for any provider caring for children and adolescents in foster care: <http://www.aap.org/fostercare/>.

Rhode Island Recommendations

Based on the well-established needs of children and youth in foster care, the requirements of the Fostering Connections Act of 2008, and AAP guidance, providers caring for children and adolescents in foster care in Rhode Island should:

- Be prepared to work closely with Rhode Island's child welfare agency, RI Department of Children Youth and Families, which is responsible for children in foster care, as well as children with behavioral health needs and those in the juvenile justice system.
- Communicate effectively to provide health information and education with child welfare and social service staff, consulting

staff, foster parents, birth parents and the children and adolescents that are in care.

- Be prepared to devote significantly more time during encounters with children in foster care given their myriad of health issues and the importance of sharing this health information to designated parties.
- Be aware of the specific and special health care needs of children in foster care and be prepared to adequately assess issues of abuse and neglect, identify and screen for mental and development health issues and be familiar with DCYF policies and procedures.
- Be prepared to coordinate services and develop care plans with specialists, social services and primary care physicians.
- Be prepared to provide a Medical Home for foster children that is comprehensive, coordinated, compassionate and continuous.

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Disclosure of Financial Interests

The authors and/or their spouses/ significant others have no financial interests to disclose.

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Overuse Injuries in the Young Athlete

Peter Kriz, MD, FAAP

In the past quarter century, traditional “free play” situations for youth in neighborhood settings have largely been replaced by organized sports programs. Year-round training, sport specialization, and participation with multiple teams have replaced recreational activities which traditionally have provided young athletes opportunity to develop a wide range of skills. Consequently, as youth sports participation has become more specialized, the incidence of overuse injuries in children and adolescent athletes has been increasing.

The purpose of this review is to provide clinicians an overview for educating young athletes, parents, and coaches about the causative factors, early recognition, and strategies for prevention of sports-related overuse injuries.

OVERUSE INJURIES: DEFINITION AND CAUSATION

Overuse injuries occur when repetitive stress is applied to a muscle, tendon, or bone, ultimately resulting in microtraumatic damage when adequate time to heal or repair has not been allotted. Nearly 50% of injuries presenting to pediatric sports medicine practices are related to overuse.¹

Causative factors for overuse injuries can be categorized into intrinsic and extrinsic factors.²

INTRINSIC FACTORS

Anatomic

Several “physiologic” malalignments of the lower extremities can predispose young athletes to overuse injuries. These include medial femoral anteversion, internal tibial torsion, and foot overpronation. Individually or collectively, these conditions can contribute to tracking abnormalities of the patella, stress injuries, and other chronic conditions of the hip, knee, and ankle for young athletes participating in sports that are particularly demanding of the lower extremities, such as running and soccer. Additionally, leg length discrepancies can contribute to chronic back and lower extremity pain, leading to compensatory changes in gait

and posture which may contribute to overuse injuries associated with lower limb malalignment.³

Growth and Development

The adolescent growth spurt predisposes the young athlete to a multitude of overuse injuries. Long bone growth advances rapidly, leaving inadequate time for compensatory elongation and flexibility of the accompanying muscle tendon units. Consequently, tightness of the quadriceps, hip flexors, hamstrings, and gastrocnemius-soleus complex often afflict the peripubescent athlete. Clinical manifestations can include acute avulsion fractures of the pelvis and overuse physeal (growth plate) injuries. The overuse physeal injuries can be further categorized as involving the tendinous attachments of the physis (traction apophysitis) as well as overload to the long bone physis. Examples of traction apophysitis include Osgood-Schlatter disease, Sinding-Larsen-Johansson syndrome, and Sever disease. Injuries to the long bone physis include distal radial physeal injury in the young gymnast due to repetitive loading, and Little Leaguer’s Shoulder, which represents an injury to the proximal humeral physis due to traction and rotational stresses encountered during repetitive throwing. All of these injuries are unique to the developing athlete due to the susceptibility of the growth plate to injury during periods of rapid growth. Because the growth cartilage is the weak link in the developing joint—the physis may be two to five times weaker than the surrounding fibrous tissue⁴—it is more susceptible to shear and tension forces, and therefore less resistant than adjacent bone and ligament to injury. Consequently, a child is more likely to sustain a physeal injury rather than a ligament tear or joint dislocation, injuries commonly seen in adults. In fact, approximately 15% of all fractures in children involve the physis.^{5,6}

Loss of flexibility and rapid growth can also contribute to muscle-tendon imbalance. Sport participation or poorly designed strength and conditioning programs may result in muscle bulk or

strength imbalances on opposite sides of a joint. Such imbalances may result in tendinitis and impingement syndromes.³

Nutrition

In the growing child and adolescent athlete, caloric intake must exceed both basal and exercise energy expenditure in order for an anabolic state to be maintained. Certain sports such as gymnastics, distance running, and dance may emphasize and encourage slenderness, ultimately compromising the growth of a young athlete.⁹ Disordered eating, menstrual dysfunction, and altered bone mineral density—otherwise known as the female athlete triad—can be the deleterious result of participation in sports which reward thinness. Overuse injuries in this population can range in spectrum from medial tibial stress syndrome to femoral neck stress fracture.

Suboptimal calcium and vitamin D intake in the child and adolescent athlete can also lead to overuse injuries related to bone health, such as stress fractures. A recent study by Gordon et al.¹⁰ discovered that 42% of New England adolescents were vitamin D-insufficient. Athletes who lack adequate sun exposure, choose restrictive diets such as vegan, or don’t ingest enough vitamin D-rich foods such as fortified milk, cereal, or oily fish, are particularly prone. Currently, bone health physicians suggest vitamin D intake of ≥ 1000 IU per day to improve vitamin D status in at-risk individuals, particularly those living at higher latitudes and during winter months.¹¹ Dietary calcium intake recommendations in the United States currently are 800-1200 mg daily for six to ten year-olds, and 1200-1500 mg daily for 11 to 18 year-olds.¹²

Pre-existing Conditions

Pre-existing conditions such as chronic disease states, previous injuries, or inadequately treated fractures can contribute to the incidence of overuse injuries. Underlying conditions such as tarsal coalition and developmental issues such as avascular necrosis of the femoral head (Legg-Calve-Perthes disease) or slipped

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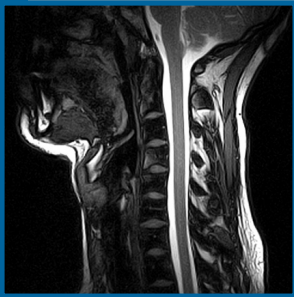
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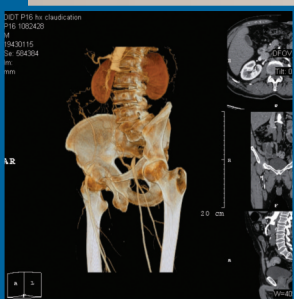


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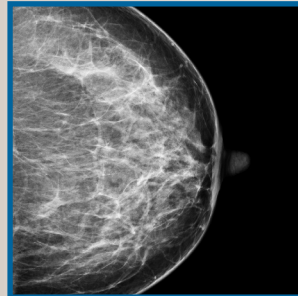
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capital femoral epiphysis can masquerade as overuse injuries such as recurrent ankle sprains or chronic knee or groin pain.³ Such conditions require an astute clinician to ensure timely recognition.

EXTRINSIC FACTORS

Training Errors

Overtraining, insufficient periods of rest, poor biomechanics or technique, year-round training and competition, and sport specialization are all elements that have contributed to the increased incidence of overuse injuries in recent decades.

While no scientifically-determined guideline to help define how much exercise is beneficial compared to what amount may be harmful to a young athlete exists, injuries tend to be more common during peak growth velocity, and may be influenced by the presence of biomechanical errors.⁷ The American Academy of Pediatrics Council on Sports Medicine and Fitness recommends limiting one sporting activity to a maximum of five days per week with at least one day off from any organized physical activity. Additionally, athletes should have two to three month reprieve (minimum) per year from their particular sport to allow adequate time for injuries to heal, and strength and conditioning programs which emphasize cross training and core strengthening should be implemented. Such breaks also serve the purpose of allowing for a mental break from the intensities that accompany the daily routine of competitive athletics—intensities that put the pediatric athlete at high risk of “burnout”.⁷

Biomechanical errors and poor technique can contribute to overuse injuries by placing abnormal stress on musculoskeletal tissues in young athletes. Biomechanical errors can be the result of predisposing conditions such as excessive lumbar lordosis, central core and peripelvic weakness, and hip flexor/hamstring tightness in the young gymnast, or periscapular and rotator cuff weakness in the young baseball pitcher. Any physical condition that alters the components of the kinetic chain, especially one that affects central core strength, will alter more distal segments of the kinetic chain.^{14,15} Examples include shoulder injuries in the throwing athlete and hamstring injuries in runners.

Single-sport specialization and its associated year-round training and competition are becoming increasingly common in youth sports. Despite the fact that only 0.2% to 0.5% of high school athletes ever succeed in making it to the professional level,¹⁶ young athletes and their parents often opt for travel and select teams over less-intense, closer-to-home youth leagues as aspirations of college scholarships and professional contracts provide motivation to excel at the highest level. Physicians caring for youth should be cognizant that motivation behind this involvement often can be parentally induced, and somatic complaints from the young athlete that do not fit typical overuse patterns of injury should be recognized as potential manifestations of “burnout”. The American Academy of Pediatrics Committee on Sports Medicine and Fitness discourages single-sport specialization before adolescence. Youth athletes who engage in a variety of sports have fewer injuries and play sports longer than those who specialize before puberty.⁹

Clinicians play a critical role in the education of parents, coaches, and young athletes regarding the risk of childhood and adolescent sports injuries.

OVERUSE INJURIES: PREVENTION

Clinicians play a critical role in the education of parents, coaches, and young athletes regarding the risk of childhood and adolescent sports injuries. Ample opportunities for providing strategies for injury prevention to young athletes and their caregivers exist as sports-related injuries comprise greater than 25% of adolescent injury visits to primary care settings.²⁰

While previous sections of this review have touched upon the American Academy of Pediatrics' Council on Sports Medicine and Fitness policy statements addressing overuse injuries, intensive

training, and sport specialization in youth sports,^{7,9} the following section briefly outlines the salient issues pertaining to resistance training and stretching in youth sports.

Resistance Training in Young Athletes

As recently as the 1980s, resistance training (used synonymously with strength training and weight training) was not often recommended for child and adolescent athletes due to presumed high injury risks with this form of exercise. Such recommendations were based on data gathered by the **National Electronic Injury Surveillance System (NEISS)** of the U.S. Consumer Product Safety Commission. This data was based on patient-reported injuries that were related to resistance exercise and equipment, and assumptions were falsely made that the injuries were due to the resistance exercises themselves rather than poor training technique, inadequate adult supervision, excessive loading, or poorly-designed equipment. Additionally, a few retrospective case reports published in the 1970s and 1980s described growth cartilage injuries in pre-adolescents and adolescents. Similarly, the majority of these injuries were due to improper lifting techniques, maximal lifts, or inadequate adult supervision. Current findings from prospective resistance training studies indicate a low risk of injury in children and adolescents who follow age-appropriate guidelines.²²

Numerous studies^{25–31} have demonstrated that comprehensive conditioning programs which include resistance and/or *plyometric* training (defined as exercise involving repeated rapid stretching and contracting of muscles to increase muscle power) are effective for reducing sports-related injuries in adolescents. While these conclusions cannot be safely extrapolated to younger children without additional research, it is possible that similar effects would be observed in pre-adolescents.

While there is no minimum age requirement at which children can begin resistance training, age seven or eight years is generally the age a child is ready for sport participation. Additionally, all participants, regardless of age, must be physically and mentally ready to listen and heed coaching instructions. In compliance with recommendations by the National

Strength and Conditioning Association, an updated position statement outlining youth resistance training has recently been published.²² Key components of these guidelines include:

- Instruction and supervision of youth resistance training should be provided by qualified adults who are knowledgeable of the physical and psychosocial uniqueness of children and adolescents
- The exercise environment should be safe and free of hazards
- Each training session should start with a five to ten minute dynamic warm-up period.
- Correct exercise technique should be emphasized, beginning with light loads.
- A variety of upper- and lower-body strength exercises should be performed, aiming for one to three sets of six to 15 repetitions.
- Abdominal and lower-back region strengthening exercises should be included.
- Symmetrical muscular development and appropriate muscle-balance around joints should be a focus.
- Resistance should be increased gradually (5-10%) as strength improves.
- Resistance training should initially occur two to three times per week on non-consecutive days.

Role of Stretching in Injury Prevention and Performance

A limited number of studies assessing the effect of pre-participation stretching on injury prevention have been conducted; their results vary in quality and have shown mixed findings. Several authors²³ have proposed that the type of sports activity an athlete participates in should perhaps determine whether or not pre-participation stretching is performed. Specifically, “explosive” type sports which utilize many and maximal **stretch-shortening cycle (SSC)** movements require a muscle-tendon unit which is compliant enough to store and release high amounts of elastic energy. Conversely, for sports activities which contain minimal SSC move-

ments (e.g., cycling, jogging), there is no need for a compliant muscle-tendon unit since the amount of energy absorption remains low. Thus, stretching exercises to improve tendon compliance before sporting activities which do not require ballistic-type movements may have no beneficial effect on injury prevention.

Until future prospective randomized studies assessing pre-participation stretching are available, the following recommendations²⁴ regarding the role of stretching in injury prevention seem prudent:

- Muscle groups known to be at risk for a particular sport (e.g., adductor and hip flexor strains in ice hockey, hamstring strains in soccer) should be targeted during pre-participation stretching.
- At least four to five 60-second stretches to pain tolerance should be applied to target muscle groups and performed bilaterally, in order to confidently decrease passive resistance to stretch.
- Dynamic pre-participation drills should be performed between pre-participation stretching and actual performance in order to avoid lingering stretch-induced stretch loss.

CONCLUSION

For primary care physicians, guiding athletes safely through the precarious stages of preadolescence and adolescence, particularly while these individuals subject their growing bodies to high volumes of physical activity at skill levels which increasingly have become more demanding and complex, is an arduous task. Compounded by extrinsic factors such as overtraining and single sport specialization, which often lacks cross training and core strengthening that is inherently integrated into a multisport athlete's conditioning, intrinsic factors such as loss of flexibility and rapid growth place a skeletally immature athlete at significant risk for growth impairment and microtrauma injuries. Prevention strategies that coordinate the involvement of physicians, parents, coaches, athletic trainers, and therapists are critical to preserving the health and well-being of the young athlete. Lastly, clinicians caring for young athletes should

not lose focus of the ultimate goal of youth participation in sports: the promotion of lifelong physical activity, recreation, and skills of healthy competition that can be used in all facets of future endeavors.⁷

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Disclosure of Financial Interests

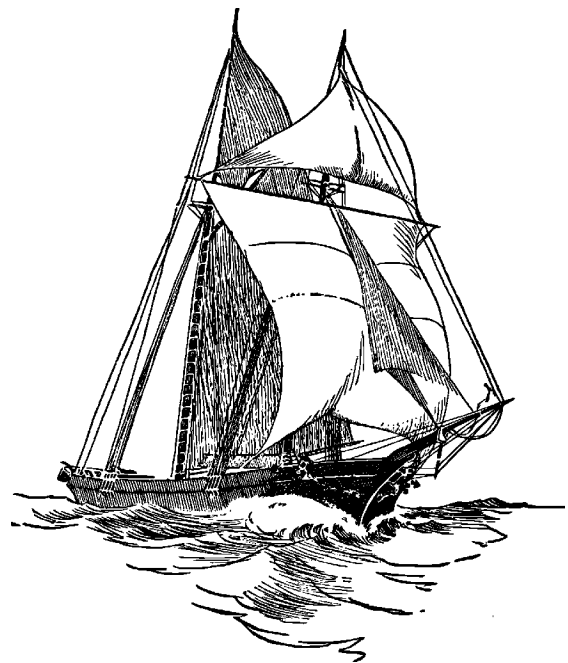
The author and/or their spouse/significant other have no financial interests to disclose.

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REQUEST FOR PROPOSALS TOWN OF JOHNSTON RETIREMENT BOARD MEDICAL DIRECTOR

The Town of Johnston Retirement Board ("Board") is seeking fee proposals from licensed and board-certified medical physicians in Rhode Island who do not reside in the Town of Johnston to serve as a medical director to the Board. The medical director shall advise the Board on medical questions pertaining to claims received by the Board concerning Fire Fighter and/or Police Officer pensions, will serve as one (1) of three (3) licensed and board-certified medical physicians who conduct an examination of each disability pension applicant, and will advise on any other matters requiring medical advice that may arise in the administration of the Town Fire Fighter and Police Officer Pension Fund. Sealed proposals will be accepted until 4:00 p.m. on July 29, 2011 at the Office of the Johnson Town Clerk located at 1385 Hartford Avenue, Johnston, RI 02919. The RFP is available at the Office of the Johnston Town Clerk at the above address starting on July 11, 2011, weekdays from 8:30 a.m. to 4:00 p.m., or may be requested electronically from the Town Clerk, Vincent P. Baccari, Jr. at vbaccari@johnston-ri.us. The Town of Johnston Retirement Board reserves the right to reject any or all responses or parts thereof, to waive any informality herein, or accept any proposal deemed in the best interest of the Town.



Meaningful Use for the Pediatrician

Raymond Zarlengo, MD, FAAP

“Change is inevitable. Change is constant.”

— Benjamin Disraeli

It seems that every other week something is new in our medical offices; we are bombarded from all directions. Insurance claims, **electronic health records (EHRs)**, medical boards, hospital privileges—change has become the norm and medicine has become a moving target. Meaningful Use, through its application to EHRs, hopefully has the potential to drastically change how we practice medicine in the next five years in a *good* way. There are compelling reasons to move your office to the electronic age. Let me explain.

In February 2009, President Obama signed the American Recovery & Reinvestment Act into law, a landmark bill that contained within it the impetus to restructure healthcare into the electronic age. Seventeen months later the Federal Register released the Final Rule for Meaningful Use. This document broadly outlines the functional requirements of EHRs in order for eligible providers and eligible hospitals to earn the significant federal stipend that was earmarked in this landmark legislation to offset the cost of computer system implementation and training. Two criteria must be met to earn the federal EHR reimbursement.

First, providers must obtain a qualified EHR product that has been certified through designated agencies. Secondly, the provider must prove functionality of this electronic record by producing health data reports for a government review. Once both steps have been successfully completed, the provider must meet either Medicaid or Medicare patient volume qualifying standards to finally earn the stipend. For pediatricians, the standard is Medicaid volume, based on the percentage of patient visits.

An **Eligible Provider (EP)** is defined as a physician, nurse practitioner, certified nurse-midwife, dentist, or physician assistant (who works in a federally qualified health center). In order to qualify for federal funds in the first year, the provider must first attest that >20% of his/her patients seen in a 90-day period are Medicaid-insured. After the first year, the 90-day period is expanded to a full 12 months. There are two categories of stipends—a higher stipend of \$63,750 is reserved for EPs who work in a federally registered health center, or whose practices serve a Medicaid patient volume that is >30%. The second category, with a lower stipend of \$42,500, is for those pediatricians whose practice volume consists of 20%-29% Medicaid insured patients. This latter category encompasses the typical pediatric practice. Practices who

successfully meet the EHR stipend criteria are eligible to receive federal stipend dollars commencing in 2011 with a five-year payout. The final date to apply for these funds is set for 2016 in order to complete the incentive payments by 2021. Given that funding streams are affected by future politics and budgets, it is recommended that EPs apply for these funds in a timely fashion in order to guarantee access to the full payment.

The first year's payment is based on the attestation that the EP has adopted, implemented and upgraded their EHR for Meaningful Use. The objectives of Meaningful Use are to improve quality, safety, efficiency and limit disparities in health care. Furthermore, the hope is to engage patients and families in their own healthcare, to improve care coordination, to improve population and public health as well as ensure privacy and security. The ultimate goal is to drive down the cost of health care and to improve health outcomes.

The second year's payment is based on achieving the three standards set forth in Stage 1. First, a provider must enroll at least 80% of his/her patients in a certified EHR. Second, the EHR must pass extensive security thresholds. Third, EPs must provide reports on 20 of the 25 Meaningful Use objectives that showcase the capabilities of the EHR. Some items

Table 1. Incentive Payment Plans to Pediatricians

Calendar Year	If You Begin Adoption in Year:					
	2011	2012	2013	2014	2015	2016
2011	\$14,167	-----	-----	-----	-----	-----
2012	\$5,667	\$14,167	-----	-----	-----	-----
2013	\$5,667	\$5,667	\$14,167	-----	-----	-----
2014	\$5,667	\$5,667	\$5,667	\$14,167	-----	-----
2015	\$5,667	-----	\$5,667	\$5,667	\$14,167	-----
2016	\$5,667	\$5,667	-----	\$5,667	-----	\$14,167
2017	-----	\$5,667	\$5,667	\$5,667	\$5,667	\$5,667
2018	-----	\$5,667	\$5,667	\$5,667	\$5,667	\$5,667
2019	-----	-----	-----	\$5,667	\$5,667	\$5,667
2020	-----	-----	\$5,667	-----	\$5,667	\$5,667
2021	-----	-----	-----	-----	\$5,667	\$5,667
Total \$	\$42,500	\$42,500	\$42,500	\$42,500	\$42,500	\$42,500

Note: This table demonstrates that Meaningful Use criteria do not need to be done in consecutive years to receive the stipend.

on the list include computerized physician order entry, e-prescribing, clinical quality measurements, clinical patient summaries, demographics, medication lists, allergy lists, transmission to immunization registries, and document tobacco use in patients older than 13. The entire list of these objectives is detailed at www.cms.gov/EHRIncentivePrograms.

After the first year of adopting a certified EHR, two more objectives are added as the next condition of achieving Meaningful Use. First, the EP must transmit data electronically to either the state Medicaid agency, or the **Centers for Medicare & Medicaid Services (CMS)**. Second, EPs must report data on three “core” **clinical quality measures (CQM)** and three “additional” measures from a quality measures menu set of 38 choices for a total of six reportable measures. For those physicians who lack the data to report from the core set, there is an alternate core set of quality measures from which to choose.

For example, the CQM core set is: hypertension (blood pressure measurement), prevention care and screening (tobacco use assessment and cessation intervention), and adult weight screening with follow-up. Most pediatricians are unable to supply data for all three of these measures. This is referred to as a denominator of zero. The next step is to assess the alternate core set of quality measures: weight assessment and counseling for children and adolescents, childhood immunization status, and influenza immunization in patients over 50. Most pediatricians can successfully generate reports for two of these alternate core measures. Therefore, to report on a total of six measures, the remaining four measures are taken from the additional list set of quality measures. Of the thirty eight clinical measures listed, the more pediatric friendly ones are asthma pharmacologic therapy, asthma assessment, appropriate use of asthma medications, appropriate testing for children with pharyngitis, and Chlamydia screening for sexually active women age 15-24. Many of the CQM are derived from the 2010 HEDIS measurements. The complete list is available at www.cms.gov/EHRIncentivePrograms. The reporting requirements of Stage 1 are designed to show that the provider is using the electronic health record in a meaningful way. It is anticipated that the

yet unwritten Stage 2 and 3 standards will have a similar reporting requirements.

To obtain federal monies providers need to register with the EHR Incentive Program. As of this writing, national Medicare registration started January 3, 2011 whereas Medicaid registration is state-specific. It was anticipated that the Rhode Island Medicaid program registration would begin in June 2011. For this program the EP must be enrolled in Medicaid, have a **National Provider Identifier (NPI)**, and implemented a certified EHR. Updated information is available at www.cms.gov/EHRIncentivePrograms/20_RegistrationandAttestation.asp.

To provide assistance in this new confusing world of EHRs and Meaningful Use, the federal government has funded state-level **Regional Extension Centers (RECs)** whose singular goal is to aid EPs in the adoption of certified EHR technology and the achievement of Meaningful Use. In Rhode Island, the REC is a service of the Rhode Island Quality Institute, a non-profit organization dedicated to improving the healthcare system in Rhode Island.

The RI REC has established many supports in an effort to meet each provider's current needs, to obtaining the right EHR for that practice and to achieving Meaningful Use. The first support is the website www.docEHRTalk.org. This nationally recognized site provides up to date information about the standards and qualifications as well as a web forum for EPs to post questions and comments about EHR issues. Once registered with the website, the provider is assigned a process manager at no cost who will provide individualized counseling. This support may include but is not limited to a practice EHR cost/benefit calculation and an assessment of the pre-qualified EHR vendors. The ultimate goal is the implementation of an EHR system that achieves Meaningful Use for the practice. As mentioned, the second support of the RI REC is the pre-qualifying of EHR vendors who have met federal standards. With so many EHRs on the market, the RI REC list of pre-qualified records is a tremendous time-saver.

There is a \$2500 subsidy from the RI REC for EPs who qualify and complete Stage 1 Meaningful Use. The structure of the RI REC stipend payment is dependent on the office EHR status. For those practices who have not yet adopted an

EHR, an initial \$1000 is paid to offset the acquisition costs and the final \$1500 is paid once Meaningful Use is achieved. For those practices who have already adopted an EHR, the \$2500 stipend is paid once the Meaningful Use criteria have been achieved. The subsidy is paid to each qualifying EP in a practice. Applications for this grant are already available as RI REC has an ambitious goal of assisting 1000 priority primary care providers.

These are exciting times, but changing times. Certainly the practice of medicine and the documentation of medicine are dramatically changing but never before has such a systems change been provided such support. The financial incentives from the federal government and local health insurance companies as well as the intellectual support from RI REC should ease the burden of this transformation for the individual provider. The goals of improved patient outcomes and reduced healthcare costs are laudable and worthy of a national EHR adoption. History will be the best judge.

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The Evolution of Quality Improvement

Sarita Warriar, MD, and Brian McGillen, MD

INTRODUCTION

With this issue, this column will now focus on quality improvement and patient safety, as the title suggests. In the coming months, we hope to explore concepts that will help physicians in and around Rhode Island improve the quality of health care delivered in their practices. We will also be publishing reports of projects developed and implemented by residents in the Warren Alpert Medical School of Brown University Internal Medicine Residency Program that, we hope, will serve as guides and/or points of interest to physicians practicing in our state. This column, though, is not intended to be just about what is happening in Providence—we encourage physicians across the state to submit descriptions of quality improvement-driven activities being implemented in their own practices, successful or otherwise. From time to time, we will also review published quality improvement research to provide evidence-based and historical background that speaks to the importance of these concepts for our daily medical practice.

A HISTORICAL PERSPECTIVE

Seeking out new methods of evaluation, new technologies, and new knowledge in order to improve the medical care and safety of patients is not a new idea. These ideas, inherent in the quality improvement and patient safety movements, have their origins in the early ethical concepts that guide the practice of medicine. Written in the 5th century BC, the Hippocratic Oath describes the goals of patient safety: “I will apply dietetic measures for the benefit of the sick according to my ability and judgment; I will keep them from harm and injustice.”¹ The Oath of Maimonides, written during the 12th century AD, asks physicians to continually improve their medical knowledge and care of patients: “Grant me strength, time and opportunity always to correct what I have acquired, always to extend its domain.... Today he can discover his errors of yesterday and tomorrow he may obtain a new light on what he thinks himself sure of today.”² These oaths serve as a reminder that many “modern” ideas in healthcare are deeply rooted in the traditions and history of the practice of medicine.

It is generally accepted that the modern era of quality improvement began 45 years ago, with the 1966 publication of a paper by Avedis Donabedian, in which he examines the evaluation of the quality of medical care.³ One of the many interesting ideas set forth in this paper is that assessing quality medical care requires the evaluation of three separate areas: structure, process, and outcome. The evaluation of structure examines the settings, personnel, and technology that are responsible for the provision of medical care. Different strategies are in place today

to assure quality in those aspects of structure: the **Occupational Safety and Health Administration (OSHA)** and The Joint Commission monitor safe conditions and practices to ensure quality in hospitals and clinics; medical licensing boards and professional organizations require board certification to ensure “quality” in physicians. Research on the process of care examines the steps that ultimately lead to the provision of medical care. This often means evaluating how care was provided—Was it timely? Guideline- and/or evidence-based? Safe for the patient?—and not necessarily the end result. Studying the end result falls under the scope of outcomes-based research. The medical community often considers the measurement of outcomes, which can be a variety of endpoints from functional recovery to survival to patient attitudes, to be the ideal goal of quality research. It is perhaps the most concrete concept, and possibly more practical and applicable to medical care than structure- or process-based evaluation.^{3,4} However, Donabedian and others^{5,7} caution against evaluating each area in isolation. Evaluating only structure depends on a seemingly logical theory that has been difficult to prove—the theory that improving the settings in which health care is delivered will lead to an improvement in medical care itself. Evaluating only process requires defining distinct standards of care—a difficult process that depends on evidence-based (or sometimes, expert consensus-based) practice guidelines, which may take a significant amount of time to develop. It is also clear that process-based improvement, i.e., improvement in how physicians deliver care, may not actually affect overall patient health. Evaluating only outcomes removes the real world practice of medicine, where factors outside the control of the health care practitioner (for example, limitations on available resources) influence outcome. Nor does evaluating only outcomes provide direction as to what contributing factors (i.e., processes) may be accounting for improvement or deterioration in outcomes. The ideal quality research, it seems, examines structure, process and outcome on a continuum of medical care, and finds ways to improve one aspect of care in order to affect the others.

Since Donabedian’s initial description of quality evaluation in health care, oversight organizations have encouraged, and sometimes enforced, improvement in the quality of health care. Starting in the early 1970s, **Professional Standards Review Organizations (PSROs)** were developed to ensure that physicians were adhering to standards of medical care for Medicare beneficiaries in each state. These efforts were met with physician backlash, as they appeared to focus on cost containment rather than quality improvement during medical audits. This led to a shift to **Peer Review Organizations (PROs)** in the 1980s—physician-inclusive organizations that reviewed appropriate

assignment to **Diagnosis-Related Groups (DRGs)**, readmission rates, and death and complication rates, with the ability to deny payment for services and punish incompetence and fraud. Quality improvement still faced many challenges, despite a stronger sense of “physician inclusion” with the advent of PROs. Outcome-based organizational reviews may not always take into account issues of process—a frustration for many practicing physicians. And while hospital-based quality assurance programs were developed to internally monitor the hospital’s physician staff, many physicians disliked the idea of being told “how to practice medicine” by non-physician monitors.^{5,6}

The transition from an outsider evaluation to an insider perspective on quality improvement blossomed in the mid-1980s throughout the 1990s, as quality “assurance” evolved into quality “assessment and improvement.” This includes the use of practice guidelines and a new focus on continuous quality improvement, an idea emerging from Japanese industry (concepts best understood as “Six Sigma” and “Lean”). In continuous quality improvement, multidisciplinary groups of practitioners examine each step of the process in the delivery of health care in order to improve overall care. Ideally, as they examine their own practices, physicians assume control over and initiate ideas for quality improvement.^{6,7} Most recently, the **Centers for Medicare & Medicaid Services (CMS)** has shifted to **Quality Improvement Organizations (QIOs)**, which partner with clinicians and health care delivery entities to improve care quality using best evidence on a local level; results have been encouraging. The importance of self-evaluation and practice improvement in medicine has led to accreditation and licensing agencies adopting quality improvement as a requirement for practice. In 2002, the **Accreditation Council for Graduate Medical Education (ACGME)** started requiring practice improvement as part of the core competency of “practice-based learning and improvement” for accreditation as a residency program in internal medicine. For physicians currently in practice, the **American Board of Internal Medicine (ABIM)** requires self-evaluation of practice performance for maintenance of certification. This can be per-

formed via completion of several web-based, disease-specific self-assessment modules.⁸ Clinically inactive physicians—who are otherwise unable to perform any self-assessment of their practice—are directed by the ABIM to educate themselves (and thereby fulfill their certification maintenance requirements) via another web-based module entitled “Essentials of Quality Improvement.” It is clear that quality improvement has become integral to our daily practices, and has evolved to encompass all fields and subspecialties in medicine.

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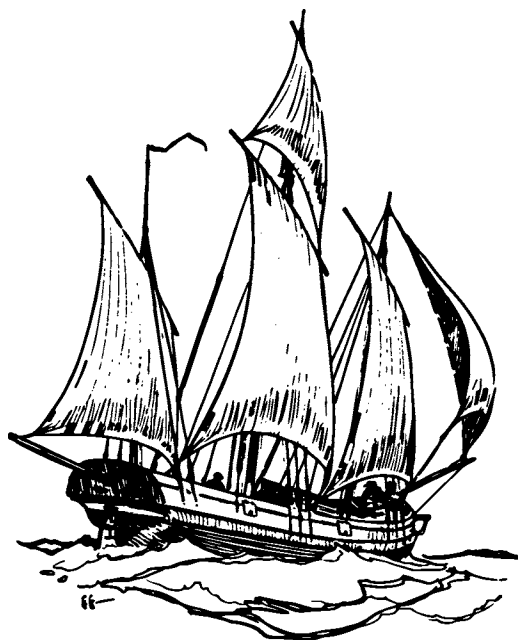
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9SOW-RI-GERIATRICS-072011

The analyses upon which this publication is based were performed under Contract Number 500-02-RI02, funded by the Centers for Medicare & Medicaid Services, an agency of the U.S. Department of Health and Human Services. The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government. The author assumes full responsibility for the accuracy and completeness of the ideas presented.

Medical Radiation: Fret or Forget?

William W. Mayo-Smith, MD

Exposure to radiation from medical tests has received a lot of attention recently. The concern has arisen from three different sources: 1.) a report on increased use of medical procedures involving radiation in the US;¹ 2.) concerns that medical radiation could increase patient risk for developing cancer;² and 3.) articles in the popular press about high doses of radiation administered inadvertently resulting in patient complications such as hair loss and confusion.

A study published by the National Council on Radiation Protection and Measurement in 2009 reported that the average radiation exposure of the US population (from background radiation including radon and cosmic rays as well as medical radiation and occupational exposures) had increased from 3.6 millisieverts in the 1980s to 6.6 millisieverts in 2006.¹ The majority of this increase was due to medical radiation exposure, both from more medical procedures performed and increased radiation per procedure for newer tests. What are these medical procedures? Nuclear medicine tests, (primarily of the heart) account for approximately 5% of medical imaging procedures but 26% of the medical dose. CT scans account for 17% of medical imaging procedures and 49% of medical dose.³

The principle concern of increased radiation exposure is cancer induction, primarily in patients less than 40 years old, particularly children. This data is based on studies of atomic bomb survivors (who received much higher doses than current imaging tests) with extrapolations of risk to the lower doses used in medical tests. These extrapolations are controversial. For example, do multiple exposures to low dose radiation equal the same risk as one exposure to a high dose? How about if there is a long interval between these low-dose exposures?

Unfortunately, what has not been well described in the current debate is the impact imaging tests have had on improving patient care. For example, CT has virtually eliminated the need for exploratory surgery and is routinely used to non-invasively diagnose cancer, ruptured brain aneurysms, appendicitis and internal organ damage in trauma patients. What is concerning, is when patients refuse an imaging test over concerns about radiation, when the test can improve their care and even be lifesaving.

Regulation of medical imaging devices which use radiation varies by state. In Rhode Island the Department of Health has regulations regarding x-ray tube registration, room shielding and monitoring radiation exposure to staff operating the equipment. There are not currently regulations regarding dose emitted by medical devices and the situation is complicated by the fact that different specialties are using medical imaging devices (radiology and cardiology for example). This is changing. Governmental agencies are investigating reporting and regulation of medical radiation and in September 2010, California passed a law requiring: 1.) reporting of the radiation dose per exam; 2.) reporting overdoses to the state; and 3.) requiring accreditation of medical imaging facilities. Manufacturers of medical imaging equipment are designing new equipment to lower the radiation dose per test, create warnings if doses exceed a certain level and report radiation dose into the

electronic medical record. Insurance companies in some states will require that imaging devices be accredited by their governing body (the American College of Radiology for example).

- What can you tell your patients about radiation? There are several practical steps patients can take to minimize their exposure to radiation.
- Confirm with their health care provider that the test is truly necessary.
- Ask if there are alternative tests which can provide the same information without radiation.
- Report all imaging tests performed in the past to avoid unnecessary repeat tests.
- Ask if the imaging machines are accredited by a national agency such as the American College of Radiology.
- Give an accurate history to the person performing the test. Imaging protocols vary depending on what the clinical question is. For example a CT scan for kidney stones may have 30% less radiation than a "normal" CT scan of the same body part.
- Ask if the imaging facility uses low dose protocols, particularly for children.

In conclusion, while there is concern for exposing patients to unnecessary radiation, for the proper indication, the benefits obtained from imaging technologies usually far outweigh the risks. This being said, referring physicians and patients should scrutinize both the need for the test and the nature of the test being performed to make sure that it is optimized for their medical treatment.

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Information for Contributors

Medicine & Health/Rhode Island is peer-reviewed, and listed in the *Index Medicus*. We welcome submissions in the following categories:

CONTRIBUTIONS

Contributions report on an issue of interest to clinicians in Rhode Island: new research, treatment options, collaborative interventions, review of controversies. Maximum length: 2500 words. Maximum number of references: 15. Tables, charts and figures should be submitted as separate electronic files (jpeg, tif, or pdf).

CREATIVE CLINICIAN

Clinicians are invited to describe cases that defy textbook analysis. Maximum length: 1200 words. Maximum number of references: 6. Photographs, charts and figures may accompany the case.

POINT OF VIEW

Readers share their perspective on any issue facing clinicians (e.g., ethics, health care policy, relationships with patients). Maximum length: 1200 words.

ADVANCES IN PHARMACOLOGY

Authors discuss new treatments. Maximum length: 1200 words.

ADVANCES IN LABORATORY MEDICINE

Authors discuss a new laboratory technique. Maximum length: 1200 words.

IMAGES IN MEDICINE

Authors submit an interesting Image, with a 300-400 word explanation.

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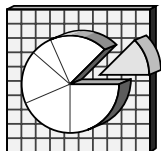
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Rhode Island Physicians' Health Information Technology (HIT) Use, 2009–2011

Rosa Baier, MPH, Rachel Voss, MPH, Blake Morphis, Samara Viner-Brown, MS, and Rebekah Gardner, MD

Health information technology (HIT) has the potential to improve healthcare quality by increasing compliance with recommended standards, reducing medical errors and otherwise improving care coordination.^{1,2} As a result, local and national payors are increasingly providing incentives for physicians' adoption and "meaningful use" of **electronic medical records (EMRs)**.³ Recognizing that policies to accelerate EMR uptake make it increasingly important to accurately measure and track HIT adoption, the Rhode Island Department of Health selected physician HIT adoption as a focus area for the state's legislatively-mandated healthcare quality reporting program.

Since 2008, the Department of Health has surveyed physicians annually to collect information about their adoption and use of EMRs and e-prescribing. Survey results for individual physicians and the state, as a whole, are published on the Department of Health's website each March.⁴ This report summarizes the statewide results from the 2011 survey and presents longitudinal trends between 2009 and 2011.

METHODS

The Physician HIT Survey was piloted in 2008,⁵ and the revised survey has been administered annually since 2009. The instrument was developed in collaboration with local stakeholders in order to consolidate data requests for physicians and synchronize measurement efforts locally. The instrument draws upon similar efforts in Massachusetts⁶ and at the national level.⁷ It includes physician demographics and data for five measures of EMR and e-prescribing adoption (Table 1). Detailed measure specifications have been described previously⁸ and are also available through the Department of Health's public reporting program.⁹ The EMR functionality measures are tailored, as needed, to reflect hospital- or office-based clinical practice.

The Department of Health administered the 2011 Physician HIT Survey electronically in January and February 2011 to 3,388 physicians licensed in Rhode Island, in active practice, and located in Rhode Island, Connecticut or Massachusetts. All 3,388 physicians received a hard copy notice mailed to the primary address on file with their license. A subset of 2,953 physicians also received email notifications and up to two reminders, if they

Table 1: Rhode Island Physician HIT Survey Measures

Measure (Scoring)	Definition
1: Physicians with EMRs (%)	Defined as "integrated electronic clinical information systems that track patient health data, and may include such functions as visit notes, prescriptions, lab orders, etc." May be in their main practice or another location.
2: Physicians with 'qualified' EMRs (%)	EMRs with specific clinical documentation, reporting, results management, decision support, and e-prescribing functions, as well as Office of the National Coordinator for HIT certification.
3: Basic EMR functionality use (0-100 scale)	Among physicians with EMRs, scores ranging from 0-100 based on the frequency of use of various clinical documentation and results management functionalities.
4: Advanced EMR functionality use (0-100 scale)	Among physicians with EMRs, scores ranging from 0-100 based on the frequency of use of various decision support, external communication, order management, and reporting functionalities.
5: Physicians who are e-prescribing (%)	Transmission of prescriptions or medication orders electronically to the pharmacy.

Table 2: Rhode Island Physician HIT Survey Measure Scores, 2011 (N=2,132)

Measure	Score
1: Physicians with EMRs, % (n=2,132)	1,729 (81.1%)
2: Physicians with 'qualified' EMRs, % (n=2,132)	576 (27.0%)
3: Basic EMR functionality use, mean (n=1,729)	73.2
4: Advanced EMR functionality use, mean (n=1,729)	51.9
5: Physicians who are e-prescribing, % (n=2,132)	1,228 (57.6%)

provided the Department of Health with email addresses during licensure and had not previously opted out of receiving email from SurveyMonkey. The response rate was 62.9% (n=2,132).

RESULTS

Survey results are publicly reported by the Department of Health on the Healthcare Quality Reporting Program's website.¹⁰ The majority of the 2,132 respondents (n=1,729, 81.1%) report having EMRs, although only approximately one in four (n=576, 27.0%) have EMRs that meet the criteria for 'qualified' systems (Table 2). The 1,729 respondents with EMRs report higher levels of basic functionalities than advanced functionalities, as expected, although both scores average greater than 50 on a 100-point scale (basic functionality use: 73.2 points; advanced functionality use: 51.9 points). Nearly six out of every 10 respondents report e-prescribing (n=1,228, 57.6%).

Physicians who do not respond to the survey are informed that participation in the survey is required, so non-response will be equated with lack of HIT adoption and reported as "failing" each measure. When the 1,256 non-respondents are included in the measure denominators, estimates decrease: approximately half of all 3,388 physicians have EMRs (51.1% vs. 81.1% among respondents), less than one in five have 'qualified' EMRs (17.0% vs. 27.0%), and approximately one in three e-prescribe (36.2% vs. 57.6%). (Because non-respondents are reported as not hav-

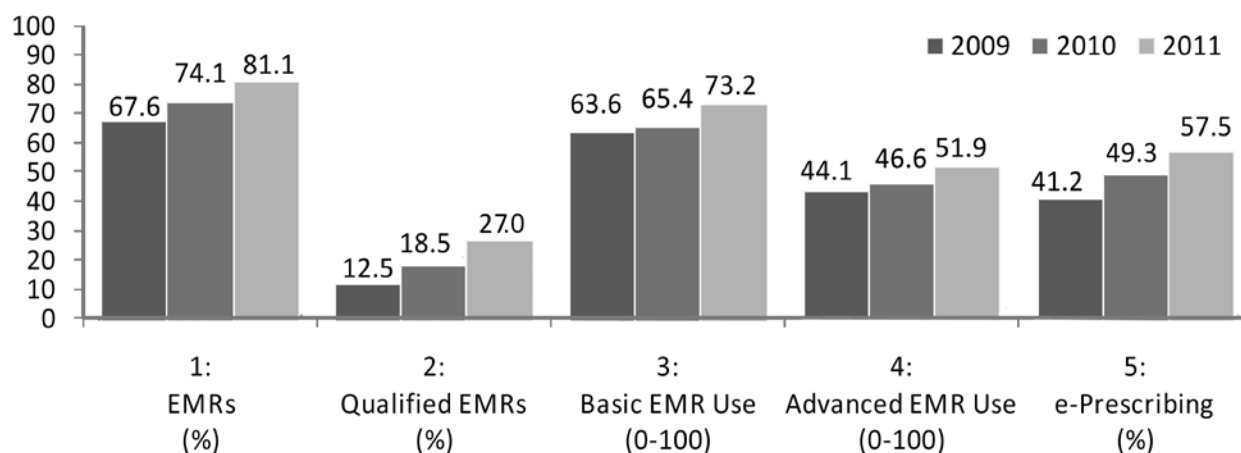
ing EMRs, they do not have scores for the EMR functionality measures.)

All five publicly-reported measures increased steadily between 2009 and 2011 (Figure 1), with the greatest increases in e-prescribing (16.3%), 'qualified' EMRs (14.5%) and EMRs (13.5%).

DISCUSSION

The vast majority of the 2,132 physicians responding to the Rhode Island Department of Health's 2011 Physician HIT Survey—81.1%—report having EMRs in one or more of their practice locations, an increase of 13.5% over three years. Although estimates of EMR adoption fall to 27.0% when applying strict criteria for 'qualified' EMRs, longitudinal data reflect consistent increases in EMR penetration since 2009 and also demonstrate that the state's EMR adoption is keeping pace with national estimates. Recent national surveys estimate EMR adoption to be 12% for hospitals (in 2009)¹¹ and 48% for office-based physicians (2009 and preliminary 2010).¹² Despite high EMR penetration, the use of specific EMR functionalities and e-prescribing is less widespread and represents an opportunity for improvement.

Unique local policies and incentives may contribute to increasing EMR adoption rates. First, Rhode Island is the only state to systematically collect and publicly report HIT adoption data

Figure 1: HIT Adoption Trends among Physician HIT Survey Respondents, 2009-2011

for 100% of licensed physicians. Second, local commercial health plans provide fee increases or incentive payments to **primary care physicians (PCPs)** who implement EMRs. These payments are based, in part, on physicians' responses to the Department of Health's Physician HIT Survey and may increase the likelihood that PCPs will respond. Third, the state has multiple physician office redesign projects encouraging EMR adoption and use, including two patient-centered medical home projects.

Physicians with EMRs may be more likely to respond to the survey, in part due to the commercial health plans' payments, and also for logistical reasons related to completing an electronic survey. Physicians with EMRs may be more likely to have computers and have access to the Internet. On the other hand, because physicians are informed that non-response will be reported as lack of HIT adoption, some physicians without HIT may elect not to respond because failing the measures is, in fact, a correct reflection of their EMR and e-prescribing use.

This survey has enabled Rhode Island to establish reliable baseline data and metrics upon which to measure changes in HIT adoption over time, increasing local transparency and setting an important precedent for other states. We expect to see continued increases in local HIT adoption, due, in part, to these public reporting efforts (market forces), the local commercial health plans' ongoing PCP incentive payments and Medicare and Medicaid initiatives slated to begin in 2011. These new initiatives will reimburse hospitals and outpatient physicians for "meaningful use," with the goal of increasing physicians' adoption of HIT functionalities that optimize patient safety. We will continue to track improvement over time using the publicly-reported metrics, and hope to see increases in both HIT penetration and the EMR functionality metrics.

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Disclosure of Financial Interests

The authors and their spouses/significant others have no financial interests to disclose.

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Images In Medicine

Splenic Cyst Manifesting as Gastric Outlet Obstruction

Nathan T. Connell, MD, and Bethany J. Gentilese, MD

A 34-year old woman with history of right oophorectomy secondary to ovarian cysts presented with a 1-week history of nausea and vomiting. Abdominal exam was only remarkable for splenomegaly and computed-tomography of the abdomen demonstrated a 10.5 x 9.0 x 8.8 cm splenic cyst. (Figures 1 and 2) It was theorized that her symptoms were secondary to gastric outlet obstruction from the enlarged spleen.

She subsequently underwent ultrasound guided drainage of the cyst which resulted in 500 mL of brown thin fluid removed with sclerosis of the cyst. No organisms were isolated upon culture of the fluid. The patient's clinical condition improved for discharge. Given the possible need for splenectomy should the cyst recur, the patient received immunizations for *Haemophilus influenzae* type B, *Pneumococcus*, and *Meningococcus* prior to discharge.

Note: All authors had access to the clinical data related to this patient's care and shared equally in the preparation of this manuscript.

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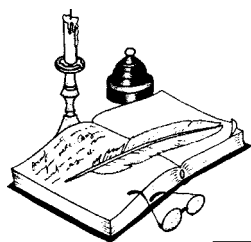
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Figure 1: CT of the Abdomen and Pelvis—Coronal View.



Figure 2: CT of the Abdomen and Pelvis: Axial View.



Physician's Lexicon

Medical Terms, Up to the Letter 'Z'

The medical profession has been accused of employing polysyllabic words unnecessarily despite their pleas that medical terminology represents a deliberate marriage of clarity and simplicity. The vernacular words—the ambiguous street names—describing anatomic parts and human ailments have been carefully avoided since they may vary from one region to another. And while there may be borrowed terms from Arabic, Hebrew, Aramaic and other Asian languages, the great majority of formal medical words are constructed deliberately from Classical Latin and Greek.

Medicine, perhaps more than any other profession, has relied upon abbreviations and acronyms to shorten its messages. And thus a standard hospital may possess an OB service, ICU units, an ER (now ED) at its side entrance, and of course a series of ORs. The meaning of such radiological terms as CT (formerly CAT) or MRI, are accepted by the lay population; and, at least amongst

medical practitioners, the meanings of the many abbreviations used by clinical pathology (such as CBC, BUN, UA, HGB, WBC, SGOT and countless others) carry no mystery.

The purpose of communication in medicine—between physicians or between a physician and a nurse, or between a physician and a patient (or surrogate), ideally at least, is to achieve brevity, minimal ambiguity and clarity.

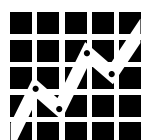
And what can be more concise, more brief, than an isolated letter? Consider the letter, 'Q'. Q Fever is now the widely acceptable word for disseminated *Coxiella burnetii* infection. And Q, by itself, is the universal symbol for coulomb, the metric measure of electric discharge. And when used by anesthesiologists, it represents the quantity of gas expended.

1895 witnessed the culmination of Wilhelm von Roentgen's experiments on the mysterious emanations generated by

electrical current passing through certain gases. For want of a better name he called them *X-strahlen*, X-rays, a term that has persisted. When he chose the letter X (to signify mystery) he must have been aware of the many uses that X had fulfilled. It was the universally adopted signature of the illiterate, the sign of a kiss in correspondence, and in Scotland, the symbol of a personal sign of allegiance to the Cross of St. Andrew.

And finally, there is the letter 'Z', the 26th and final letter of the current English language but the sixth letter (zeta) in classical Greek and not to be confused with omega, the 24th and last letter of the Greek alphabet. The letter 'Z' has stood for so many qualities in the American mind, especially Zorro the masked avenger who left his first initial upon the skins of many miscreants, that medicine has consciously avoided it as a physical representation.

— STANLEY M. ARONSON, MD



RHODE ISLAND DEPARTMENT OF HEALTH
MICHAEL FINE, MD
INTERIM DIRECTOR OF HEALTH

VITAL STATISTICS

EDITED BY COLLEEN FONTANA, STATE REGISTRAR

Rhode Island Monthly Vital Statistics Report Provisional Occurrence Data from the Division of Vital Records

Underlying Cause of Death	Reporting Period			
	July 2010	12 Months Ending with July 2010		
Diseases of the Heart	Number (a) 137	Number (a) 2,239	Rates (b) 212.6	YPLL (c) 3,049.5
Malignant Neoplasms	146	2,265	215.1	6,207.5
Cerebrovascular Diseases	22	461	43.8	640.0
Injuries (Accidents/Suicide/Homicide)	28	621	59.0	10,113.0
COPD	24	492	46.7	577.5

Vital Events	Reporting Period		
	January 2011	12 Months Ending with January 2011	
	Number	Number	Rates
Live Births	943	11,806	11.1*
Deaths	940	9,821	9.2*
Infant Deaths	(5)	(62)	5.3#
Neonatal Deaths	(5)	(57)	4.8#
Marriages	199	6,073	5.7*
Divorces	236	3,239	3.0*
Induced Terminations	382	4,216	357.1#
Spontaneous Fetal Deaths	59	698	59.1#
Under 20 weeks gestation	(52)	(631)	64.3#
20+ weeks gestation	(7)	(67)	5.7#

(a) Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.

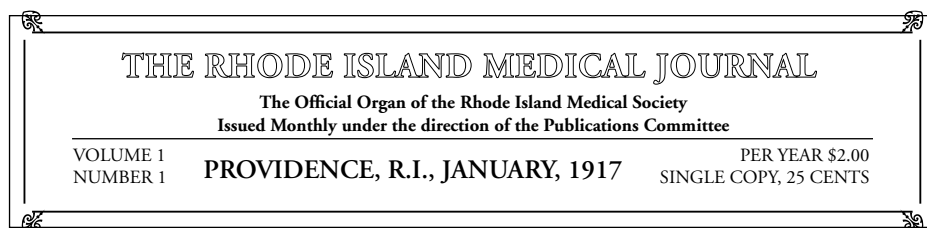
(b) Rates per 100,000 estimated population of 1,053,209. (www.census.gov)

(c) Years of Potential Life Lost (YPLL).

Note: Totals represent vital events that occurred in Rhode Island for the reporting periods listed above. Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.

* Rates per 1,000 estimated population

Rates per 1,000 live births



NINETY YEARS AGO, JULY 1921

The journal issues covering the months of July, August, and September of 1921 are covered in a single issue. This is due to a printers strike and an “enforced quiescence.”

Alex M. Burgess, MD, writes of issues surrounding the treatment of diabetes—in particular, revelations that have occurred within the past ten years. It is essentially distilled into two factors: undernutrition and education. For one, Dr. Burgess discusses acquiring a “systematic underfeeding sufficient tolerance for food so that on a diet which will produce enough energy and supply enough proteins to maintain physical efficiency, one can still be free from abnormal or increasing amounts of blood sugar with its attending symptoms and deleterious effects.” Furthermore, he stresses the need to instruct and educate the diabetic on the importance of maintaining a controlled diet. He notes that “There is perhaps no disease in which the success of the treatment depends more upon the patient than it does in the case of diabetes.”

An editorial looks at cigarette smoking among youths and concludes: “Young people who use cigarettes always show symptoms of poisoning such as pallor, dullness in activity, inaccuracy in reasoning, and the capacity to carry out fine work is lacking. Tobacco is more or less a dangerous narcotic to the senses and higher brain activities, and no person can be in complete possession of his faculties and power of control, and exercise the highest efficiency possible who uses tobacco.”

FIFTY YEARS AGO, JULY 1961

In the section marked “The Washington Scene” it is noted that the American Medical Association supported the Kennedy Administration’s proposal to provide \$750 million in matching funds for construction of medical, dental, public health and osteopathic schools. A letter from the AMA to the Senate Labor and Public Welfare Committee states: “As an Association of 179,000 practicing physicians, we are vitally interested in maintaining the high quality of medical education in the United States because of its direct relationship to medical care. For over a century, the American Medical Association has been actively and effectively engaged in the improvement of medical education in the United States. It can now be said, with assurance, that medical education in this country is superior to that found anywhere else in the world.”

Abstracts from papers written by Rhode Island medical professionals include “Demyelinating encephalomyelitis in a case of tetanus treated with antitoxin” by Harold W. Williams and Francis H. Chaffee, and “Herpes simplex” method of Arthur B. Kern, and the 1915 “Before and after Lister” “Demyelinating encephalomyelitis in a case of tetanus treated with antitoxin” (1915) by William W. Keen.

Alex M. Burgess, MD, (who contributed to the July–September 1921 journal) discusses the changing scene in medical education and practice. He opines, “Times have changed but man has remained essentially the same.” He begins with his days at Harvard Medical School in 1909 under Dr. Charles V. Chapin, and moves forward in time, stopping here and there to examine such issues as specialty boards, expansion of hospital services, and the development of group practice. He looks ahead to the development of new and improved techniques, equipment, drugs, and education, but also notes the rising costs of medical and hospital care.

Several authors discuss medical crises occurring in the forms of over-regulation and big government. E. Vincent Askey, MD, makes a call to arms thusly following a alarming buildup of threats to modern society: “I want to call you to arms in a war that has two fronts. We must continue to battle for preservation of our medical freedoms against the inroads of governmental intrusion, while at the same time we must strengthen our assault to provide the finest medical care for all our people.

TWENTY-FIVE YEARS AGO, JULY 1986

Kathryn Cullen, BSN, MS, talks about the goals of the Parkinson’s Disease Referral and Information Center. She discusses problems with timely and correct diagnoses, how to discuss issues surrounding Parkinson’s, and challenges for the patient and family. By creating an atmosphere of acceptance and support, the Center hopes to ease the burden and find the cure” through research, information, and building networks.

In keeping with the theme on Parkinson’s disease, author Robert Bernen pens a thoughtful, moving piece dealing with recognizing the onset of the disease and his final acceptance of the disease’s presence. He concludes with: “I always disliked people with tremors or tics and avoided their company. Now I have the tremor and would avoid myself if I could. Instead I go around everywhere with myself just as before, resist the recluse tendency, cultivate a sense of humor to put others at their ease, and try to accept this new condition of life. The tremor and the loss of spontaneity have been the hardest things to accept. They make my life look to me like an awkward coordination of two unlike personalities, one who shakes while the other, embarrassed, looks on helplessly; one who wills, while the other reluctantly obeys; a constant conflict of selves. I may seem strange to talk of being two persons, but that is the way having Parkinson’s disease feels to me.

Joseph Friedman, MD, discusses recent research advances in Parkinson’s disease in the first of two parts. His piece is subtitled, “Chance discovery has provided animal models for research.” These test animals will allow for better analyses prior to human trials. Robert Rafal, MD, presents a piece on the mental disorders of Parkinson’s disease.

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