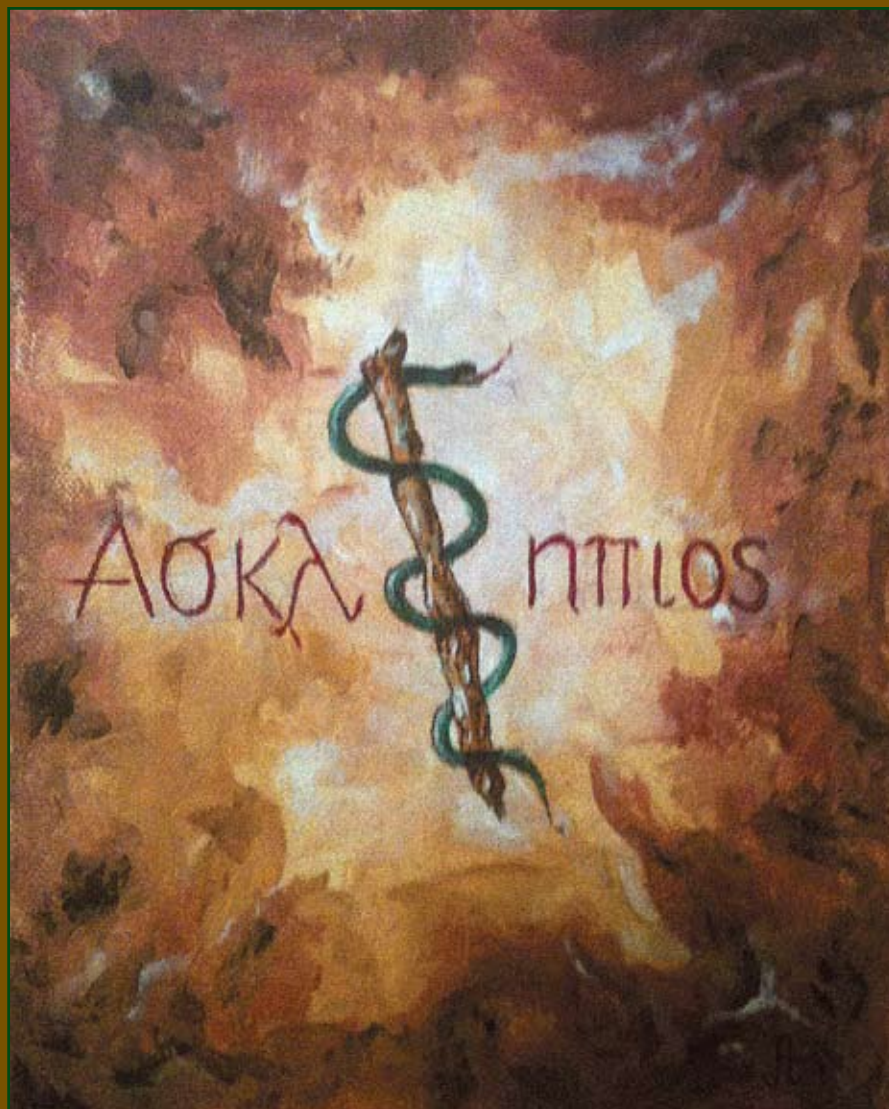


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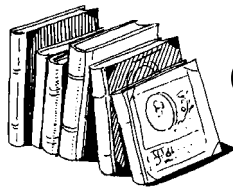
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Commentaries

Number Needed to Treat (NNT); Number Needed to Harm (NNH)

PROBLEMS IN DIAGNOSIS ARISE DAILY. We understand what we mean when we say, "I think you have disease X." We often don't know for sure, as in diagnosing Alzheimer's or Parkinson's diseases (PD), and we understand that we have a certain degree of confidence in being correct. "I'm sure you have disease X; I'm pretty sure; I think you might..." We are less clear, I think, in how we classify the efficacy of our treatments. When we treat infections we expect cure in 100% of our patients, and failing this, we blame the organism for being resistant, the patient for not taking their medication properly or having an anatomic or immunologic disorder. But this is not true for the chronic ailments that afflict 75% of the elderly. We don't treat hypertension because it is causing symptoms. It is the "silent killer." It is treated to prevent problems, namely heart attack, stroke, kidney failure and atherosclerotic disease, and the secondary problems each of these may then cause. Yet our drugs are not 100% effective even when they are "successful," since we confuse treating a risk factor for the disease with the disease itself. We reduce the likelihood of impending stroke and heart attack when we lower blood pressure. We do not prevent all strokes or heart attacks. We can be 100% confident that we reduced the blood pressure, but that doesn't translate into improved health for the vast majority of the treated patients since they are not going on to have strokes or heart attacks. By treating them they are not "getting better." They are "not getting worse."

A large percentage of our contemporary treatments are intended to reduce risk, not treat symptoms. An operation for a pinched nerve solves a problem, whereas a carotid endarterectomy is intended to prevent one. Treating diabetes controls blood sugar and therefore the problems of hypoglycemia (confusion, seizures, coma) and hyperglycemia (confusion, seizures, polyuria, polydipsia, weight loss, stroke-

like symptoms) and may possibly reduce some of the long term complications. When we treat Parkinson's or Alzheimer's diseases, we are treating symptoms, and not altering the pathological process of the disease itself. We can tell if these drugs "work" because the symptoms improve.

Complicating our concept of treatment-prophylaxis is the problem of identifying suitable "biomarkers," which are clearly defined metrics of the disease's severity. How well does a medicine control pain, as measured by an accepted pain scale? How does it control motor function in PD as measured by some accepted scale? But in the case of cholesterol, which is not a symptomatic disorder but a "biomarker" of increased risk of vascular disease, we found that simply lowering it, which a recent drug did quite significantly, led to no decrease in the risk of heart disease or stroke, much like getting rid of the smoke, but not the fire.

I recently attended a stimulating lecture on the drug treatment of refractory depression. Once he got over the problem of defining "refractory," the speaker introduced the concept of "number needed to treat" and "number needed to harm," which was a foreign concept to several in the audience. It's a valid and sometimes useful way to estimate treatment effect. It is helpful for estimating efficacy for prophylactic and treatment therapies, especially when taking cost into account. For example treating systolic blood pressures above 160 in the elderly, one needs to treat 120 people to prevent one stroke in a year. Carotid endarterectomies performed by highly competent surgeons must be performed on 40 arteries to prevent one stroke per year in patients with asymptomatic stenosis. Clopidigrel is mildly better at reducing stroke risk than aspirin but 250 people need to take the drug in place of aspirin to prevent a single stroke per year, at about 150 times the price.



In psychiatric trials the numbers are interesting because we think of treating disorders like depression as we treat an infection, try one medication, titrate the dose, then if not successful, try another drug. Yet a very good result for treating depression may have an NNT of 3-5, which means that only 20-30% of treated patients are improved by drug, a ratio that would not inspire confidence in most of us, although this is in addition to the benefit of placebo. And this NNT, which is fairly typical for psychiatric treatments, compares favorably with the outcomes for common medical treatments.

Should we be telling patients that our drugs are effective 30% of the time or less? Do we really expect this result, which, I suspect most readers will find uncomfortably poor, when we prescribe or take a new drug, or do we expect that most of our patients will improve? I note, in passing, that the results of double-blind trials and "real life" are quite different, with the placebo effect of the doctor giving a known "effective" treatment, versus the measured placebo effect of simply participating in a drug trial. I assume that the former is the more potent, but perhaps not.

We can stand things on their heads and calculate the "number needed to harm," which is a measure of side effects. How many subjects are treated before causing an iatrogenic complication? This is a less useful number because the potential side-effects are considerably larger and often less well-defined than the precisely defined treatment effect. Death, however, is a rather well-defined outcome and there is no universally acceptable ratio to establish a certain benefit to counter-balance the risk of death in a minute percentage of the population. The extremely small increase in death rate for people taking atypical antipsychotics earned those drugs a "black box" warning by the FDA, which made the drugs harder to use.

The NNT can be used to calculate financial outcomes. If it costs a certain

amount for each stroke in terms of work lost, money spent on hospitalization and rehabilitation, not counting the intangibles, one can see that spending tens of thousands of dollars in extra medication cost may still save money even if a seemingly negligible number of people are spared the stroke or myocardial infarct. Seatbelts save lives and enormous amounts of money even though few people ever need them.

NNT is useful to keep in mind when we choose treatments, especially in the elderly. Sometimes when a patient complains about having to take yet another drug, or about side-effects, it may be that the marginal return on the drug use is simply not worth the cost.

— JOSEPH H. FRIEDMAN, MD

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Contagion as a Fiscal Problem

AN ALLEGEDLY NEW COMMUNICABLE DISEASE ENTERS OUR IMMEDIATE community. We hear about it—cloaked in frightening metaphors—in the local newspaper and its existence is verified in the other publications within the state. Learned commentators then remind us of the mayhem wrought by prior pestilences and pandemics; and both our wise statesmen and clergy admonish us, perhaps urging a day of fasting and repentance, to prepare us for the worst.

Important questions necessarily arise: Is this an utterly new pestilence or merely a recurrence, such as influenza, of an infectious disease that has repeatedly arisen amongst humans in the past? Is the infection confined to humans, such as poliomyelitis, or does it transcend species barriers, such as with influenza, and concurrently infect swine, birds or other creatures?

We will assume now that this newly arisen pestilence affects both children and adults indiscriminately, is suppressed by no known antibiotic and results in a relatively high mortality rate. A local committee is then assembled to determine what the community might do. Their decision might be: (1) to do nothing beyond the customary use of private medical offices, clinics and emergency rooms; or (2) to appeal to the citizenry to participate in specified days of prayer, sacrifice, humiliation and fasting; or, (3) to encourage the civic leadership to proactively invest in known preventive measures and community-wide educational interventions.

The decision is not a simple one: Community priorities must be examined. The past experience of other communities must be explored. And certainly a set of fundamental questions will demand answers before tangible steps will be taken.

- Is there certainty that the disease is communicable; that is, caused by a living organism such as a virus, a bacterium or a fungus? If communicable, how is it communicated? By air, by drinking water? By physical contact (including venereal intimacy)? Or by the intermediacy of an insect such as a mosquito or tick?
- Have neighboring communities been similarly affected? And if not, have they been duly warned of the nature/characteristics of this new ailment?
- Has the United States Public Health agencies, particularly the Centers for Disease Control & Prevention, been ap-

propriately notified and their active assistance requested, including their superb laboratory facilities and mobile epidemiologists?

- Is the disease of sufficient economic and social importance—for this community—to justify a formal preventive medicine campaign?
- Is there the political will to use public moneys to confront the epidemic? The United States, in the 1920's and 1930's was confronted with a near epidemic of venereal disease, particularly syphilis and gonorrhea. Many religious communities were strenuously opposed to any federal anti-syphilis program, contending that the core disorder was sinful behavior and hence not in the domain of public health and certainly not within the realm of federal responsibilities. By the mid-1930's, a cautious public education program was instituted with posters in public bathrooms declaring: "Stamp Out Venereal Disease!" as well as an earnest program in the armed forces to combat venereal disease.
- Are there religious scruples that might cause sufficient numbers to resist the contemplated preventive medicine interventions (e.g., a recommendation for the use of condoms)? Or secular worries that vaccines might cause autism?
- Are there medical interventions (such as enhanced water purification methods or enforceable quarantines or vaccines) which have been shown elsewhere to be medically proven and cost effective for this particular pestilence?
- Do any of the preventive measures, such as a contemplated vaccine, carry significant morbidities and complications? (As an example, the original, crude Pasteur vaccine to combat rabies, devised in the late 19th Century, was clearly effective medically but its use carried a high frequency of serious, and sometimes fatal, neurological complications.) In the sphere of public health, there are no free lunches.

A communicable disease—whether it be new or recurrent—poses many challenges and choices for the affected community. Ultimately, of course, it resolves itself to a mixture of competing

factors: the anticipated morbidity and mortality caused solely by the pestilence, the economic losses caused by illness in the work force, the effectiveness of the proposed interventions, the added pressures upon existing institutions (hospitals, clinics, private offices), and, of course, (to the practical politicians), the anticipated costs to the community.

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Disclosure of Financial Interests

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

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Evaluation of Possible Inflammatory Bowel Disease: A Survey of Rhode Island Physicians

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INTRODUCTION

The inflammatory bowel diseases (IBD), Crohn's disease (CD) and ulcerative colitis (UC), cause significant morbidity to patients of all ages. Abdominal pain and diarrhea are common in patients with IBD, but also occur in non-inflammatory conditions of the gastrointestinal (GI) tract such as irritable bowel syndrome (IBS). As the initial presentation of IBD may be protean, a prolonged delay in diagnosis has been described.¹ Patients with undiagnosed IBD particularly those with non-acute symptoms are often first evaluated by their primary care physician (PCP). Therefore, PCPs are often in the position of deciding if and when patients with non-specific GI symptoms require referral to a specialist.

Despite the frequency with which abdominal pain and diarrhea are encountered in the primary care setting,² little is known about how physicians approach these problems. Understanding the diagnostic decisions of PCPs in the evaluation of these common GI symptoms is important to determine whether they are taking the appropriate steps to differentiate IBD from other conditions and making timely referrals for definitive diagnosis.

We surveyed PCPs to understand how they evaluate common GI symptoms. We hypothesized that patient and physician characteristics influence the diagnostic evaluation of possible IBD.

METHODS

Participants

This survey was conducted, in part, to validate information about referral patterns of IBD in Rhode Island as part of the Ocean State Crohn's and Colitis Area Registry. A mailing list of all physicians in RI was obtained through the American Medical Association. Internists, family practitioners, pediatricians and obstetrician/gynecologists (Ob/Gyns) comprised our sampling frame. As a practical consideration 25% of PCPs were randomly selected for inclusion. Non-responders were contacted with two additional mailings. A five-dollar gift card was included in the first mailing.

This study was approved by the Institutional Review Boards at Lifespan/RI Hospital and at Massachusetts General Hospital.

Survey instrument

Physicians were mailed a five-page, 26-item questionnaire in March 2008. Survey items included demographic information, questions pertaining to two clinical vignettes, and questions assessing the importance of various factors in the choice of specialist referral. Content and face validity were established by two gastroenterologists and four PCPs, respectively.

The vignettes described hypothetical patients presenting with chronic lower abdominal pain (vignette 1) and chronic diarrhea (vignette 2). The duration of symptoms was not provided. After reading the vignettes, respondents were asked to

ABSTRACT

Background: Patients with undiagnosed inflammatory bowel disease (IBD) are often evaluated initially by primary care physicians (PCPs). Despite the frequency with which PCPs evaluate chronic abdominal pain and chronic diarrhea, little is known about how they approach these symptoms. **Objectives:** To determine the diagnostic practices and referral patterns of PCPs when confronting a patient with potential IBD. **Methods:** We conducted a mail survey of PCPs practicing in Rhode Island. Clinical vignettes describing patients with chronic abdominal pain and chronic diarrhea were presented. Respondents were asked to indicate how they would evaluate these scenarios and when they would refer to a specialist. **Results:** 432 PCPs were surveyed; 35.6% responded. Wide variation in PCPs' definitions of chronic abdominal pain and chronic diarrhea was found, with only 26% and 51 % of physicians, respectively, defining these symptoms to be chronic per standard definitions. Laboratory testing was found to vary significantly with practice type ($p < 0.01$ for 2 patient groups). Patient age influenced the ordering of diagnostic imaging ($p < 0.0001$), while patient gender did not. **Conclusions:** There is significant variability among PCPs in the threshold after which common gastrointestinal symptoms become chronic as well as in their diagnostic evaluation of these symptoms. This variability may lead to a lag in the diagnosis of IBD and influence patient outcomes.

specify the duration at which they consider the presenting symptom to be chronic. They were then asked to select the diagnostic tests they would order if the patient were a ten year-old child, 30 year-old male, or 30 year-old female. Respondents were also asked about their likelihood of referring the patient to a specialist if their clinical evaluation suggested IBS or IBD using a seven-point Likert scale (from one equals very likely to refer to seven equals very unlikely to refer). Lastly, respondents were asked to determine the importance of various factors when choosing a specialist using a five-point Likert scale (from one equals strongly agree to five equals strongly disagree).

Statistical Analysis

All analyses were performed using SAS 9.2. Descriptive statistics were calculated for demographic characteristics. Separate analyses were performed for the two vignettes. Analyses for the pediatric patient were limited to pediatricians and family practitioners. Internists and family practitioners were used for the analyses for both the adult patients; Ob/Gyns were added to the analysis of the adult female. Bivariate analyses were conducted using number of laboratory tests as the dependent variable. Independent variables included characteristics of the physician. Characteristics were regarded as significant if $p < 0.05$. To determine if physician type predicted number of laboratory tests ordered for the 30 year-old female vignette, a one-way Analysis of Variance was conducted. For the pediatric and adult male patient, as only two types of physicians were used in each of these models, simple t-tests were performed.

RESULTS

Survey respondents

We identified 4,004 physicians practicing in RI, of whom 1,736 met our definition of PCP. Four hundred thirty-two (25%) PCPs were randomly selected for participation. Surveys were returned by 154 physicians for a response rate of 35.6%. Internists comprised 41.6% of respondents, followed by family practitioners (21.9%) and Ob/Gyns (11.7%). One hundred and thirty-seven survey responses were included in the analysis. Reasons for exclusion in the analysis were: respondent retired or not in clinical practice ($n=3$), respondent deceased ($n=1$), respondent did not meet definition of PCP ($n=8$), survey less than 50% complete ($n=3$), respondent's practice no longer in RI ($n=2$). Demographic characteristics of the survey respondents are summarized in Table 1.

Definition of Chronic Abdominal Pain and Chronic Diarrhea

There was wide variation in the duration of symptoms respondents considered necessary for a patient to have chronic abdominal pain or chronic diarrhea. With regards to abdominal pain, only 26% of physicians responded that abdominal pain is chronic once it is greater than three months in duration. Fifty-six percent reported that pain lasting less than three months is chronic and 21% reported that pain is chronic after four months (Figure 1). The definition of chronic abdominal pain was significantly associated with provider type with Ob/Gyns defining abdominal pain as chronic only after it was present for more than five to six months, longer than any other practice type surveyed ($p < 0.001$).

Table 1: Demographic Characteristics of Respondents

Characteristic	
Age (mean years, range)	45.0 (26 to 74)
Years since graduation from medical school (median, range)	18 (1 to 57)
Characteristic	
N (%)	
Gender	
Male	66 (49.2)
Female	71 (51.8)
Race	
White	122 (89.7)
Asian	7 (5.1)
African-American	3 (2.2)
Other	4 (2.9)
Practice Type	
Internal Medicine	57 (41.6)
Family Practice	30 (21.9)
Ob/Gyn	16 (11.7)
Pediatrics	32 (23.3)
Other	2 (1.4)
Practice Setting	
Hospital based	42 (30.7)
Community based	85 (62.0)
Other	10 (7.2)

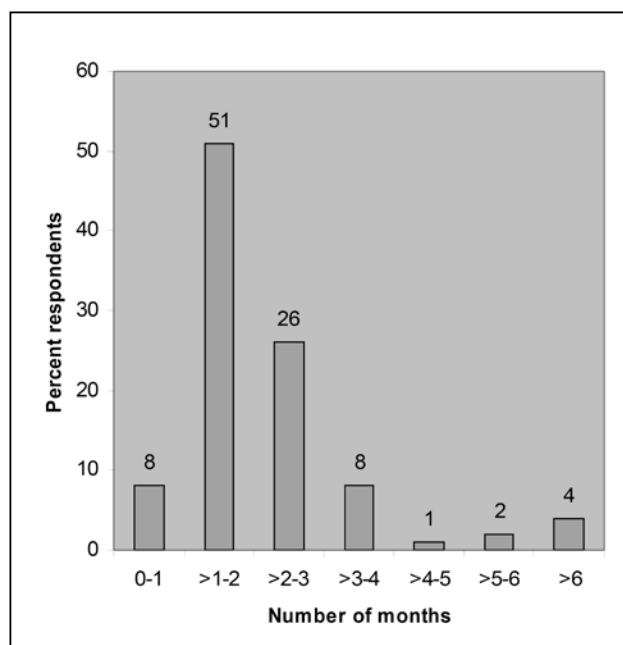


Figure 1. Survey response: after how many months would you consider abdominal pain to be chronic?

With regards to diarrhea, 51% of physicians defined diarrhea as chronic when it lasts greater than one month while 41% responded that diarrhea must last greater than two months before it is chronic and 8% said that diarrhea lasting less than one month is chronic (Figure 2).

Diagnostic Testing by Patient Age and Gender

We found no difference in the mean number of laboratory tests ordered by PCPs when approaching the various patients with either abdominal pain or diarrhea.

With regards to imaging, physicians were less likely to order fluoroscopic studies or **computerized tomography (CT)** for a child with chronic abdominal pain ($p < 0.001$) or chronic diarrhea ($p = 0.01$) than for adults. However, they were more likely to order abdominal ultrasounds or x-rays for a child with

abdominal pain than for adult patients of either gender ($p < 0.001$ for both) (Table 2).

Diagnostic Testing by Provider Type

We found the number of laboratory tests ordered to vary significantly by physician type but not by physician gender, age, ethnicity, race, or year of graduation from medical school (Tables 3 and 4). Pediatricians ordered more laboratory tests than family practitioners for the child with chronic abdominal pain ($p = 0.004$) and chronic diarrhea ($p = 0.04$). In the evaluation of chronic abdominal pain or diarrhea in the adult female, internists ordered significantly more tests than family practitioners who in turn ordered more tests than Ob/Gyns ($p = 0.003$ for abdominal pain; $p = 0.004$ for diarrhea). Similarly, internists ordered more tests than family practitioners for the adult male with chronic abdominal pain or diarrhea although the difference was not significant.

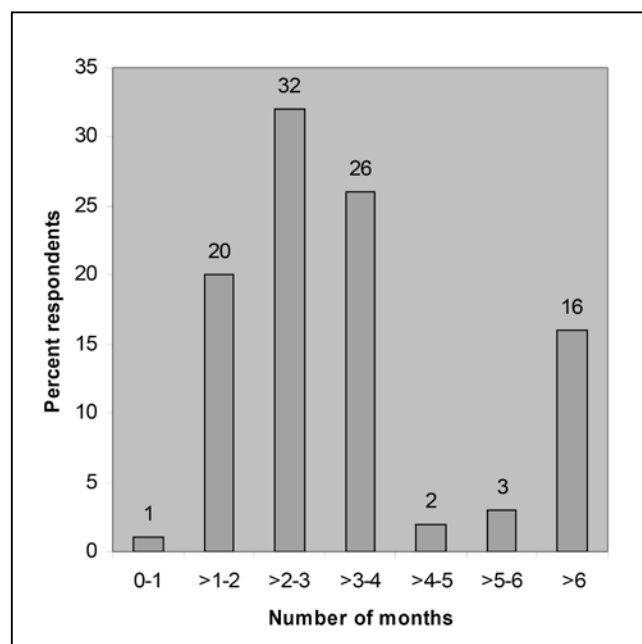


Figure 2. Survey response: after how many months would you consider diarrhea to be *chronic*?

Referral Patterns

PCPs reported a greater likelihood of referring patients with suspected IBD (median Likert score equals one, very likely to refer) to a specialist compared with those with suspected IBS (median Likert score equals three, somewhat likely to refer).

We found no significant difference among the patient groups or physician types when comparing the likelihood to refer for suspected IBD.

Factors influencing choice of specialist

Prior experience with the physician was found to be the most important factor in choosing a specialist. Least important was the practice setting of the specialist (i.e. free-standing office versus hospital-based office).

DISCUSSION

Abdominal pain and diarrhea are the leading GI symptoms for which patients are seen in outpatient clinics in the United States.³ These symptoms are also the most common presenting symptoms of IBD.⁴ Given that they are also associated with many non-inflammatory GI conditions it is critical that PCPs be able

Table 2: Diagnostic testing by patient age and gender

	10 year-old child	30 year-old male	30 year-old female	p-value
	Mean (SD)			
Labs for chronic abdominal pain	7.6 (3.9)	7.9 (4.1)	7.8(4.2)	NS
Labs for chronic diarrhea	9.4 (3.6)	10.3 (4.5)	7.9 (4.1)	NS
Radiographic exam for chronic abdominal pain				
SBFT, BE, or CT abdomen	0.16 (0.41)	0.70 (0.60)	0.63 (0.61)	<0.01
Abdominal ultrasound or AXR	0.88 (0.74)	0.52 (0.69)	0.22 (0.56)	<0.01
MRI abdomen	0 (0)	0.02 (0.16)	0.02 (0.14)	NS
Radiographic exam for chronic diarrhea				
SBFT, BE, or CT abdomen	0.14 (0.40)	0.35 (0.55)	0.34(0.55)	0.04
Abdominal ultrasound or AXR	0.23 (0.47)	0.25 (0.60)	0.22 (0.56)	NS
MRI abdomen	0 (0)	0.10 (0.11)	0.01 (0.10)	NS

SBFT=small bowel follow through; BE=barium enema; CT=computed tomography; AXR=abdominal x-ray; MRI=magnetic resonance imaging

to identify the subset of patients who may have IBD and perform timely referral for definitive diagnosis.

Current estimates for the diagnostic lag in children with IBD are 7.1 months for those with CD (with greater lag time in patients with small bowel disease only), 6.7 months for those with UC, and 14 months for patients with indeterminate colitis.⁵ For adults, diagnostic lag is longer. Wagtmans et al. found the time to diagnosis from onset of symptoms in patients with CD was 1.9 years⁶ while the Manitoba IBD Cohort Study reported a mean lag time of 11 years (range 3–48 years).¹ Shorter lag times presumably allow for earlier initiation of therapy which may in turn improve health-related quality of life and reduce morbidity.

In this study we used clinical vignettes to determine how PCPs approach patients with possible IBD. We found significant variability in the duration of time after which PCPs consider abdominal pain and diarrhea to be chronic. As the differential diagnoses for each symptom differs based upon duration, wherein IBD is more likely to be considered when symptoms are chronic, this variability may be clinically relevant.

Chronic abdominal pain has not been well defined in adults; however, the definition used in pediatrics over the last 40 years is pain which occurs continuously or intermittently for more than three months.⁷ This definition has been accepted by the American Academy of Pediatrics and the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition.⁸ Among our respondents, only 26% considered pain to become chronic at this point. Twenty-one percent answered that pain must last longer to be chronic. Likewise, chronic diarrhea is defined as the production of loose stools for more than four weeks.⁹ Only half of the respondents (51%) defined chronic diarrhea according to this criterion; 41% answered that diarrhea is not chronic until it lasts more than two months. These higher thresholds held by many PCPs may account for some of the delay in diagnosis reported in patients with IBD.

We asked respondents to choose which laboratory and imaging studies they would obtain if the patient presented in the vignettes were a child, adult male, or adult female. Surprisingly, we found no difference in the mean number of laboratory

tests ordered for these three demographic categories. Differences in imaging were found, however, with fewer fluoroscopic studies and CT scans ordered for the pediatric patient compared with the adult patients. This difference likely reflects a greater tendency for physicians to minimize radiation exposure in children compared to adult patients. However, as 25% of patients with IBD are diagnosed before age 16, it is important for PCPs to do the appropriate work-up for IBD in children presenting with symptoms of IBD.¹⁰

When we evaluated the number of tests ordered by physician characteristics, we found only provider type to be significantly associated. In particular, we found that family practitioners ordered significantly fewer tests than pediatricians for the work-up of the ten year-old child and fewer tests than internists for the work-up of the adult male and female patients. These findings are consistent with prior studies which have shown that even after adjusting for patient case-mix that family practitioners and general internists have statistically significant differences in their resource utilization with internists tending to use more resources.¹¹ Further data are needed to determine whether patients with undiagnosed IBD experience different outcomes depending on their PCP's specialty.

We found that PCPs with a high suspicion for IBD were very likely to refer to a specialist but only somewhat likely to refer a patient with suspected IBS. While this difference may reflect a higher level of comfort among PCPs in the diagnosis of IBS, it raises the possibility that patients with IBD who present with IBS-like symptoms may not undergo timely referral. This hypothesis is bolstered by the fact that IBS is widely misunderstood and that despite published algorithms for diagnosis, physician patterns in the evaluation of IBS differ significantly. A study of family practitioners, for example, found that only 14% understood the Rome I criteria, while another study found that just 35% knew that the Manning, Rome and Rome II criteria are used to diagnose IBS.^{12,13} In addition, only 49% could identify a group of symptoms typical of IBS.

Carrying a diagnosis of IBS has implications for later diagnosis of IBD. The Manitoba IBD Cohort Study found that patients diagnosed with IBS were more likely to experience longer symptom duration before diagnosis of IBD than those without IBS. In addition, the relative risk of detecting IBD in patients initially diagnosed with IBS has been found to be 16-fold higher compared to age-matched controls without IBS.¹³ These findings

Table 3: Diagnostic testing for chronic abdominal pain by provider type

Practice type	Mean number of labs (SD)		
	10 year-old child	30 year-old male	30 year-old female
Family Practice	6.0 (3.9)	7.6 (4.1)	7.8 (4.0)
Internal Medicine	N/A	8.1 (4.1)	8.6 (4.1)
Ob/Gyn	N/A	N/A	4.6 (3.6)
Pediatrics	8.6 (4.2)	N/A	N/A
p-value	0.004	0.58	0.004*

* p-value is for ANOVA test for the three practice types (i.e. Family Practice, Internal Medicine, and Ob/Gyn)

Table 4: Diagnostic testing for chronic diarrhea by provider type

Practice type	Mean number of labs (SD)		
	10 year-old child	30 year-old male	30 year-old female
Family Practice	8.6 (4.2)	9.1 (4.3)	9.1 (4.3)
Internal Medicine	N/A	11.0 (4.5)	11.3 (4.2)
Ob/Gyn	N/A	N/A	7.3 (4.5)
Pediatrics	10.1 (3.0)	N/A	N/A
p-value	0.04	0.22	0.003*

* p-value is for ANOVA test for the three practice types (i.e. Family Practice, Internal Medicine, and Ob/Gyn)

may reflect an initial misdiagnosis of IBS and argues for a lower threshold for referral among PCPs when the evaluation suggests IBS, especially when established diagnostic criteria are not met.

There are several limitations to this study. First, our study uses clinical vignettes to assess diagnostic practices. Although the vignettes were designed to represent real world scenarios, they are hypothetical cases. Responses to the vignettes, therefore, may not accurately reflect actual physician practices. In addition, our survey represents PCP diagnostic practices from a single state which limits its generalizability. Our response rate of 35.6%, while comparable to the response rate reported in other mail survey studies of physicians,^{14,15} raises the possibility of non-response bias. Lastly, our study does not allow for correlation between ordering practices and patient outcomes. We found that physician type predicts the number of tests and imaging studies; however, we were unable to assess if patients of the high-ordering providers have different outcomes than patients of the low-ordering providers.

CONCLUSIONS

Given the significant time lag between symptom presentation and diagnosis in patients with IBD it is important to document the diagnostic practices of PCPs in the evaluation of its common presenting symptoms. We found wide variation in the duration of symptoms that PCPs consider necessary in order for abdominal pain and diarrhea to be chronic. This may influence their inclusion of IBD on their differential diagnoses. We also found significant variation in the number of laboratory tests ordered by provider type and the number of radiographic studies ordered by patient type. These differences may lead to variability in time to diagnosis with patients of certain provider types more or less likely to be diagnosed in a timely fashion.

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State-Wide Support for Physician-Mothers Who are Breastfeeding

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DESPITE THE SIGNIFICANT HEALTH AND COST benefits of breastfeeding at both the individual and societal levels, there is a substantial gap between breastfeeding recommendations and practices among mothers in the United States, even those mothers who are themselves medical students and physicians. Among the major barriers to breastfeeding confronted by physician- and future physician-mothers are short parental leaves, fast-paced and time-intensive jobs, and historically little workplace support for pumping breast milk, including both time and private, clean space. Here we describe ongoing statewide collaborative efforts to improve workplace support for physician-mothers in Rhode Island.

Improving and supporting the health behaviors of physicians may have the added benefit of a wider-spread impact on the health behaviors of patients via counseling, support, and role modeling.

BREASTFEEDING HAS HEALTH AND COST BENEFITS TO INFANTS, MOTHERS, BUSINESSES, AND SOCIETY

Because of the numerous benefits associated with breastfeeding, the American

Academy of Family Physicians (AAFP), the American Congress of Obstetricians and Gynecologists (ACOG), and the American Academy of Pediatrics (AAP) all advise mothers to breastfeed for at least one year with the introduction of complementary foods at six months.¹⁻³ Because breastfeeding is the “gold standard” infant nutrition that provides optimal health for both mothers and infants, lactation experts have recently shifted to describing the risks of formula feeding rather than the benefits of breastfeeding. For mothers, not breastfeeding is associated with an increased risk of post-partum blood loss, post-partum depression, and ovarian and breast cancer when compared with women who do breastfeed.⁴ For children, risks of formula feeding include an increased incidence and severity of a wide range of infectious diseases as well as chronic diseases such as diabetes mellitus and obesity.⁴ Among businesses, promoting breastfeeding can lower employee absenteeism and turnover rates while increasing employee productivity and retention. Employer-implemented breastfeeding programs have been shown to decrease employee healthcare costs.⁵

When business benefits are combined with those related to direct medical care, it has been estimated that \$13 billion could be saved if 90% of US families breastfed exclusively for six months.⁶ If all of the Healthy People 2010 goals regarding breastfeeding had been met, national cost savings would have been \$2.2 billion.⁶

THERE IS A GAP BETWEEN BREASTFEEDING RECOMMENDATIONS AND PRACTICES AMONG US PHYSICIAN-MOTHERS

Although breastfeeding initiation rates for all US mothers almost reached the Healthy People 2010 goal of 75%, rates for continued breastfeeding at six and twelve months remained well below the national goal.⁷ (Table 1) For working women in general, employment negatively affects breastfeeding duration,^{8,9} as does shorter length of maternity leave,^{9,10} full-time work status,¹⁰⁻¹² and the absence of a lactation support program at work.^{10,13-14}

Typically, the rates of breastfeeding initiation among physicians are higher than the regional average¹⁵ and national recommendations.¹⁶ However, the du-

Table 1. National (Healthy People 2010/2020)¹ and Rhode Island (Rhode Island's Plan for Healthy Eating and Active Living 2006–2012)² breastfeeding baselines and goals.

	RI Baseline	National Baseline	National 2010	National 2020
	2004*	2006*	Target	Target
Ever breastfed	63%	74%	75%	82%
Breastfeeding at 6 months	28%	44%	50%	61%
Breastfeeding at 12 months	12%	23%	25%	34%
Exclusive breastfeeding through 3 months	35%	34%	40%	46%
Exclusive breastfeeding through 6 months	12%	14%	17%	26%
Number of employers with worksite lactation support programs	0.0005%	25%	**	38%
Number of live births occurring in facilities that provide recommended care for lactating mothers and their babies	11%	3%	**	8%

* These are the years used for 'baseline' data collection at the national and local levels, respectively.

** No 2010 targets were set for these indicators.

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Table 2. First-hand testimonials from breastfeeding physician-mothers in a wide variety of specialties and clinical settings and at different levels of training.

"The most difficult part about pumping is getting a private, clean space. I have occasionally been allowed to use office spaces, but if so I have to waste 15 minutes trying to find someone to give me a key. More often, I have pumped in supply closets (sitting on boxes of medical supplies!), my back to the door, hoping that no one walks in; in bathrooms, using a towel to try to keep the pump supplies sanitary; or in my car, keeping my fingers crossed that no one walks by and sees me! It is discouraging and unsanitary on many levels.

"I dream of having an easy-to-access, clean, space with a locked door for future moms-in-medicine, to both obviate the cleanliness issues and to logistically facilitate our efforts to provide breast milk to our babies. Imagine, maybe I could even return pages at the same time! Indeed, pumping would be much less of a 'big deal' if we knew there were a nearby space that we could safely, cleanly, quickly, and predictably use."

"When I first started at [the hospital], I was pumping for my infant son. Since this is a health care environment, I didn't think finding a spot to pump would be very challenging. I couldn't have been more wrong. After seeing my patients, I started asking the nurses if I could use a clinic room to pump. They said no, they need the room for patients. Then I thought that I would certainly be able to use a space at employee health. After all, this was a health care issue and they didn't seem to use the rooms much except to read PPDs. Even though the exam rooms in the employee health office were not in use, they also turned me down."

"There have been many times I have used bathrooms, conference rooms, car, and the worst part is not even that someone might see me in a very immodest and embarrassing situation, because as a mother I'll do anything to give breast milk for my child, but that anxiety over someone walking in, or if there is no phone, that someone is paging me and I am letting that page go for a while, which decreases my let-down and thereby diminishes the milk I can collect for my child and the speed at which I can collect it. With a locked door, a private space, and a phone (ideally a computer), I am completely relaxed, and I notice my milk comes out faster and in greater quantities. And I can still answer my pages to provide timely care for my patients. It's a win-win situation for my mental health, my baby's nutrition, and my patients' care!"

"I recently gave a lecture at [a hospital] and had to pump in a very strange place. I pumped in this cold, dark, auxiliary cafeteria without a lock or a sink or fridge adjacent to where I was lecturing to a bunch of male doctors."

"I nursed for 10 months [as a surgeon-in-training]. The average turnover time for us [in each operating room] is about 15-20 minutes. [Residents/fellows] are expected to place the dressing at the end of the case and position the patient at the beginning of the case so the turn over time is all you have to see the next patient and fix the paper work, finish paper work on the previous patient, check labs, take care of the floor patients, and eat. We generally had 5-6 cases a day and our cases were 1-2.5 hours long so I had to pump between every other case.

"When I started trying to find a room, everyone was very nice and very well intentioned. I was offered an office to pump in by at least 2 people. Unfortunately I soon learned that spending 5 minutes finding the person who has the key to the office or waiting 5 minutes for someone to wrap up what they are doing to vacate the office when you only have 12 minutes to pump and 3 minutes total to set up and clean up and get back to the room, 5 minutes is actually a long time. Therefore I started pumping in a single stall bathroom that was next to the OR. I would stand at the sink and make phone calls while pumping. Cell phone reception within the bathroom was spotty but luckily as long as I stayed near the sink I could usually send and receive calls. I also could never get used to eating while in this public bathroom (for obvious reasons) so I often had to skip eating."

ration of breastfeeding is shorter.¹⁵⁻¹⁷ Particular to physician-mothers is an often intensive work schedule resulting in insufficient time to express milk, especially among medical students or doctors who do not have their own private offices.¹⁶

Male and female physicians with personal or spousal success with breastfeeding are more likely to discuss infant nutrition with their patients and generally feel more confident in counseling them about breastfeeding. The otherwise lack of confidence is associated with a paucity of formal medical education about breastfeeding during training.¹⁸⁻²⁰

PUMPING BREAST MILK REQUIRES A CLEAN, PRIVATE SPACE

The fundamental physiological mechanism of breastfeeding is supply and demand. Therefore, for mothers who are separated from their infants for work or school, pumping breast milk regularly is essential. In order to maximize milk production, mothers often start pumping weeks before returning to work in order to begin storing and freezing breast milk. With the most efficient, electric double pump, the process of expressing four to eight ounces of milk takes 15-20 minutes. In addition to privacy, pumping breast milk requires: an electrical outlet, a sink in which to clean parts that touch the breast/breast milk, and a clean space in order to minimize the risk of contaminating the milk. Historically, it has been a significant challenge for medical students and physician-mothers working at hospitals in Rhode Island to find a clean, private location to pump breast milk at their work place. Many lactating mothers have had to resort to pumping in bathrooms, cars, or supply closets. (Table 2)

In order to maintain a steady supply of breast milk and to avoid complications such as mastitis, mothers who are separated from their infants must pump approximately every three to four hours and ideally for long enough to express all the milk from each breast.²¹⁻²² Two key factors that affect breast milk expression are pumping interval and stress level. First, the more milk that is pumped, the more is produced. Conversely, when a woman stops pumping, milk production subsequently down-regulates. As for stress level, physiologically, relaxation facilitates

Table 3. General barriers and possible solutions to increase breastfeeding among working mothers.

	Barriers	Solutions
Home	<ul style="list-style-type: none"> • Lack of partner support • Family/friends who do not breastfeed 	<ul style="list-style-type: none"> • Increased education about the risks of formula feeding / benefits of breastfeeding • Increased number of role models
Workplace	<ul style="list-style-type: none"> • Insufficient break time to pump • Lack of room/facilities to pump • Lack of support from colleagues/supervisor • Inability to afford a breast pump 	<ul style="list-style-type: none"> • Implementation of workplace lactation programs • Establishment of private, clean lactation rooms in convenient locations • State, insurance, or workplace subsidies for breast pumps as medical devices
Physician's Office	<ul style="list-style-type: none"> • Lack of education about how to breastfeed • Lack of information about how to pump 	<ul style="list-style-type: none"> • Improved education during training • Education about the importance of workplace lactation programs starting in medical school
Policy	<ul style="list-style-type: none"> • Lack of state and/or federal mandate requiring compensated break time for all employees • Lack of state and/or federal mandate requiring appropriate space for all employees 	<ul style="list-style-type: none"> • Local and national advocacy for support of lactation among working mothers

milk production and let-down and stress inhibits it. For physician-mothers who may try to pump hurriedly in the midst of a busy day in a less than ideal location, stress can be a significant obstacle to adequate milk let-down, resulting in both physical discomfort as well as the additional stress of an inadequate food supply for their infants. (Table 2)

PUMPING BREAST MILK IN THE WORKPLACE HAS LEGAL SUPPORT

Although still lenient compared to other states,²³ Rhode Island began to protect a mother's right to pump breast milk at work in 2003 (R.I. Gen. Laws § 23-13.2-1).²⁴ Today, mothers are also protected at the federal level by the new Section 4207 of the **Patient Protection and Affordable Care Act (PPACA)**, which took effect on March 23, 2010 (P.L. 111-148). This Act states that employers are required to provide at the minimum "reasonable break time for an employee to express breast milk for her nursing child for one year after the child's birth each time such employee has need to express the milk." Employers are also required to provide "a place, other than a bathroom, that is shielded from view and free from intrusion from coworkers and the public, which may be used by an employee to express breast milk."²⁵

RHODE ISLAND HAS RESOURCES FOR BREASTFEEDING PHYSICIAN-MOTHERS

In response to existing gaps between the health recommendations of physicians and their health behaviors, there are two local organizations that are advocating on behalf of physician-mothers throughout the state to minimize some of the most obvious workplace obstacles to successful breastfeeding as a way to optimize maternal-child health.

The Rhode Island Breastfeeding Coalition (RIBC)

Established in 1992, the RIBC is a coalition of community organizations that focuses on increasing breastfeeding knowledge and awareness in the community and among health care professionals. The RIBC additionally aims to support local businesses in the promotion of breastfeeding by systematically distributing the Department of Health and Human Services' Business Case for Breastfeeding Toolkit to Rhode Island employers. Through grant funding obtained by the Initiative for Healthy Weight, the RIBC also awards mini-grants to employers to start or enhance their lactation programs.

In conjunction with the employee policy with regard to breastfeeding that is being developed by the Department of

Human Resources at Brown University, medical students and faculty from the Warren Alpert Medical School of Brown University have received a grant from the RIBC to develop a lactation room in the new medical education building that opened in July 2011. In this new building, the lactation room for students, faculty, and staff is located within the third-floor 16-exam room Clinical Exam Suite. The medical school is also using this funding opportunity to provide basic information about maternal and child health care to all medical students.

MomDocFamily (MDF)

Established in 2003, MDF of Brown's Office of Women in Medicine and Science is a multi-specialty organization of 255 physicians and medical students who are mothers. MDF's mission is to "provide mentorship and support for women physicians in all stages of careers and training as they face the challenges and rewards of combining a medical career with motherhood".²⁶ Through a needs assessment of its members, MDF found that multiple groups of physicians working at several Brown-affiliated hospitals had unmet needs with respect to lactation space, with specific groups at **Rhode Island Hospital (RIH)** and the **Miriam Hospital (TMH)** facing the greatest challenges. In response to

this need, and with support of TMH Human Resources and a grant from the RIBC, MDF established a new lactation room at TMH for HIV and Infectious Disease physicians as well as one in the TMH Emergency Department, which is part of the largest academic Emergency Medicine program in the U.S. At RIH, with the help of the same RIBC grant, a lactation room is being developed near the operating rooms. Dedicated lactation spaces for physicians at Women and Infants Hospital are under review. Finally, a new lactation space has been created for physicians and female staff at Butler Hospital this past summer.

The RIBC and MDF have also collaborated to develop a list of existing lactation accommodations for physicians in Rhode Island hospitals. This list is posted on the MDF website (<http://biomed.brown.edu/owims/MomDocFamily>) and updated on an ongoing basis.

EVERYONE CAN BE AN ADVOCATE.

Despite the recognized benefits of breastfeeding, many physician-mothers face overwhelming barriers that prevent them from following the very recommendations they give to their patients. (Table 3) However, as awareness of this gap and its significance for physician-mothers, their families, and their patients increases, support to improve the health of mothers and their babies is gaining momentum, as exemplified by the Surgeon-General's 2011 Call to Action to Support Breastfeeding.²⁷ Whether or not you are a breastfeeding physician-mother (past, present, or future), here are a few actions to consider in support of your physician and non-physician colleagues who are:

- Advocate for formal lactation support programs and accommodations in every workplace.
- Educate both employees and employers regarding the need for this support and how it will positively affect their businesses (e.g., through the Business Case for Breastfeeding Toolkit).
- Support universal enforceable legislation to improve employer compliance with workplace breastfeeding accommodations.

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Case of Malignant Priapism and Review of the Literature

Haris Ahmed, Sammy Elsamra, MD, and Mark Sigman, MD

INTRODUCTION

Cancer metastasis to the penis is rare and manifestation as a priapism is even more uncommon. We present the case of a 73 year old man with urothelial carcinoma of the bladder status-post radical cystectomy who presented with malignant priapism as the first sign of cancer recurrence.

CASE PRESENTATION

The patient was a 73 year-old Caucasian man who presented to the emergency room with penile edema and pain of unclear etiology. Three months prior he underwent a radical cystectomy, bilateral pelvic lymph node dissection, and ileal-loop urinary diversion for multifocal high grade T4aN2Mx urothelial carcinoma (with involvement into prostate and seminal vesicles and extensive lymphovascular invasion but negative margins). He was initially diagnosed with high grade non-muscle invasive urothelial bladder carcinoma two years earlier and was noted to have progression to muscle invasive disease 18 months later despite treatment with intravesical *Bacillus Calmette-Guerin* (BCG). The patient's exam was remarkable for penile edema and tenderness throughout corpora cavernosa and glans penis. Three months prior to procedure, a **computerized tomography** (CT) of the abdomen and pelvis revealed no evidence of metastatic disease. He was diagnosed with a malig-

nant priapism vs. metastatic infiltration to penis and subsequently underwent **magnetic resonance imaging** (MRI) of his pelvis (and penis) revealing a focus of sacral metastasis but no definite penile metastasis. Penile edema and pain were refractory to corporeal cavernosal aspiration or phenylephrine injection and penile nerve blocks, respectively. Attempts at palliating the patient with large doses of continuous and **patient controlled analgesia** (PCA) narcotics were ineffective and effecting his mentation. Further, he developed some erythema on the penile shaft and a black eschar on the glans that was concerning for a cellulitis prompting treatment with vancomycin IV. Because of concerns associated with a high narcotic requirement and wet gangrene of the penis, he underwent a palliative radical penectomy three weeks after admission. Pathology revealed widespread urothelial carcinoma with lymphovascular invasion and extensive necrosis with positive proximal margins. His pain improved significantly. A subsequent CT of the abdomen and pelvis revealed metastatic disease to the lung, liver, and sacrum. He elected to be made comfort measures only and died seven weeks after admission.

DISCUSSION

Priapism is the prolonged occurrence of penile erection in the absence of sexual stimuli. It may present as either low-flow

or ischemic, when there is obstruction of venous drainage from the corpora cavernosa, or high-flow, due to increased arterial flow to the corpora. Priapism may be caused by numerous factors, the most common being medications such as alpha agonists, vasoactive agents, or antipsychotics, or any process that may increase the viscosity of blood such as polycythemia, hematologic malignancy, or sickle cell anemia.¹

Metastasis of tumor to the penis can result in both ischemic, by occlusion of cavernosal outflow, or high-flow priapism, via arterial fistulization. This is extremely rare with roughly 100 cases reported to date according to a large contemporary review. The most common primary sites include the prostate, bladder, and recto-sigmoid, but reports of metastasis from kidney, testes, lung, stomach, bone, ureter, hepato-biliary, and urethra have been reported.^{2,3}

The penis has a rich vascular supply, which it shares with nearby organs. Metastasis can occur via retrograde venous and lymphatic routes, arterial spread, direct extension, and possibly implantation secondary to instrumentation.⁴ Diagnosis can be facilitated by CT and MR imaging, and is definitively made by either biopsy or intracorporeal aspiration.⁵

As invasion of the penis is generally by metastatic spread, it usually represents disseminated disease, and carries with it a poor prognosis. Patients are generally in poor health with other sites of spread arising before penile metastasis.^{2,3} However, cases of isolated penile metastasis have been reported, occurring several years after treatment of the primary disease. Malignant priapism has also, in one case besides the present case, been reported as the initial indication of cancer recurrence.⁴

Treatment should be catered to the patient, focusing on their general health, the extent of metastasis, the severity of their symptoms, and their overall prognosis, as well as the type of priapism when present. Often treatment is limited in

ABSTRACT

Malignant priapism, or priapism secondary to locally invasive or metastatic cancer, is a rarely reported phenomenon with a very poor prognosis. We report on a case of malignant priapism secondary to metastasis of urothelial carcinoma of the bladder in a 73 year old gentleman who underwent a radical cystectomy with negative margins but positive nodal disease three months prior to presentation. The rapid progression of disease and resultant demise of this patient is unusual even when compared to the limited available literature. Rapid progression to muscle invasion despite intravesical immunotherapy, histologic involvement of the prostate and seminal vesicles with extensive lymphovascular invasion, and the rapid development of metastasis are all consistent with the aggressive nature of a cancer that has metastasized to the penis. Further, while conservative penile sparing therapy may be a goal in patients with limited life expectancy, ongoing pain and infectious concerns may force the physician to resort to a penectomy.

these patients to palliative and supportive care. Priapism can be initially managed with intracavernosal irrigation and instillation of phenylephrine, as well as shunts. In cases of high-flow priapism, which can be caused by arterial rupture secondary to tumor invasion, embolization of the internal pudendal artery may be an option⁶. While pain is not a prominent feature in penile metastasis, it can be severe in the case of malignant priapism. Dorsal nerve section or total penectomy may be employed in cases of intractable pain. Overall, local excision, partial or total penectomy, external beam radiation, and chemotherapy have not shown to improve survival, though brachytherapy has been used in cases of penile metastasis and has been shown to control local disease progression for up to one year.³

Survival in patients presenting with malignant priapism is usually less than one year. According to one study, the time interval between primary tumor and penile metastasis ranged from three to 60 months, with an average of 19 months. The time interval between penile metastasis and death was 0.25 months to 18 months, with an average of six months, and no patients surviving beyond 18 months.² With penile metastasis, patients with rectal primaries appear to have somewhat better survival with the longest on record being over nine years. The longest survival recorded for a GU primary is seven years in the case of a prostatic adenocarcinoma. Still, the average survival in patients with genitourinary primary is only 47 weeks, even with treatment, giving those with metastatic disease to the penis a very poor overall outcome.³

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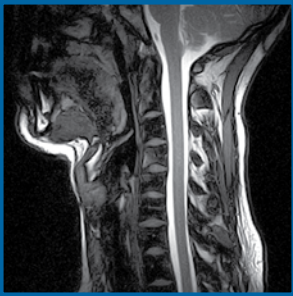
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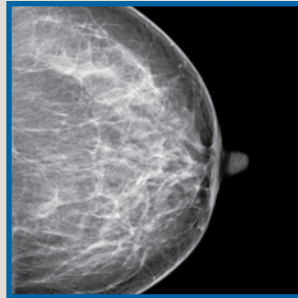
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Ascending Colon Ganglioneuroma

Robert Bagdasaryan, MD

65 YEAR OLD GENTLEMAN UNDERWENT screening colonoscopy. A 5 mm polyp has been identified in the distal ascending colon and has been excised.

Microscopically, spindle-shaped cells along with a collection of ganglion cells are identified in the sections taken from the polyp.

Ganglioneuromas are mature, benign tumors composed of a proliferation of nerve fibers, Schwann cells and ganglion cells. They most commonly arise in the posterior mediastinum and the retroperitoneum. Ganglioneuromas of the intestinal tract are less common and can occur at any level, from the stomach to the anus, and even described in the gallbladder. They are most common in the colon and rectum.

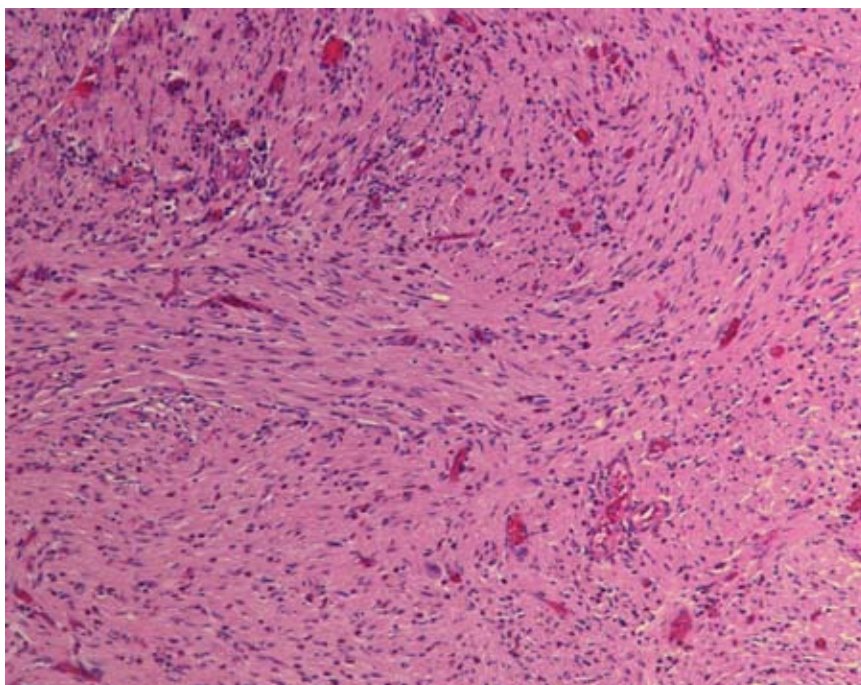
Intestinal ganglioneuromas fall into three main groups:

1. solitary polypoid ganglioneuromas
2. ganglioneuromatous polyposis
3. diffuse (transmural) ganglioneuromas.

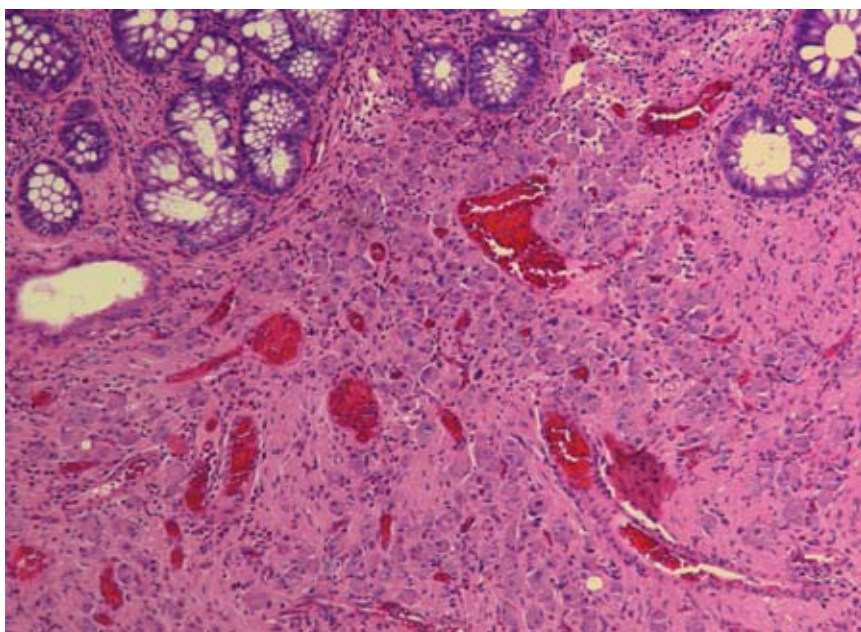
They usually are small and are endoscopically indistinguishable from adenomas or hyperplastic polyps. No sex predilection has been noted. Solitary polypoid ganglioneuromas are not associated with systemic manifestation and do not require long-term follow up. Ganglioneuromatous polyposis has been associated with multiple cutaneous lipomas and skin tags, Cowden disease, juvenile polyposis, co-existent colonic adenoma or carcinoma, and von Recklinghausen's neurofibromatosis. Diffuse ganglioneuromas occur in patients with multiple endocrine neoplasia (MEN IIb), von Recklinghausen's neurofibromatosis, multiple intestinal neurofibroma or neurogenic sarcoma.

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Ganglioneuroma. Spindle-shaped cells.



Ganglioneuroma. Ganglion cells.

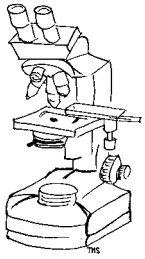
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The Creative Clinician

Drug-Induced Chronic Pancreatitis

Sarah C. Lee, BA, and Samir M. Dalia, MD

OVER 100 MEDICATIONS HAVE BEEN reported to cause acute pancreatitis, generally in isolated case reports. None have been postulated to cause chronic pancreatitis with necrosis. An 84-year-old woman presented with syncope after sudden onset of non-bloody emesis and mid-abdominal pain for five hours. She was afebrile with a blood pressure of 121/66 and found to have serum lipase > 4000 U/L. **Computer tomography scan (CT)** with contrast was consistent with pancreatitis and showed an obstructive picture with intrahepatic and common bile duct dilatation. Her surgical history was significant for cholecystectomy over 20 years ago. She denied alcohol use but had been taking sulindac 200mg twice daily and hydrochlorothiazide 12.5mg daily for over 6 years, and had started lisinopril 10 mg daily one year ago. She described one episode of milder but similar sharp abdominal pain 6 years ago that resolved spontaneously. Imaging done at the time had revealed a dilated common bile duct without gallstones, but no etiology was found on subsequent workup. Initially the patient's Ranson's criteria predicted a 2% mortality. Her home medications were held and she received supportive care.

ASSESSMENT

On the first hospital day, she became febrile and deteriorated rapidly with ileus and increasing hypoxia with new onset atrial fibrillation. Repeat CT scan of the abdomen showed necrotizing pancreatitis (Figure 1). Her 48-hour Ranson's criteria predicted a 15% mortality. The patient was started on IV meropenem and was transferred to the intensive care unit. In this patient's case, the finding of a dilated common bile duct in the absence of a gallbladder limited the cause to papillary stenosis, gallstone obstruction in other parts of the biliary tract, and medication. A magnetic resonance cholangiopancreatography was negative for any obstruction or sphincter abnormalities. Thus, we propose this patient's chronic pancreatitis resulted from repeated sub-clinical drug-induced acute pancreatitis which predisposed her to increased risk of necrotizing pancreatitis when a third insult, lisinopril, was added to her medications.

DISCUSSION

We report a case of necrotizing pancreatitis with progression to chronic pancreatitis following concurrent use of three implicated medications, including sulindac (Clinoril; Merck Sharp & Dohme, West Point, Pennsylvania), hydrochlorothiazide, and lisinopril. Though drug-induced pancreatitis is rare, hydrochlorothiazide and lisinopril are frequently prescribed antihypertensives with a variable latency period and documented severe cases of necrotizing pancreatitis.¹ The proposed mechanism for lisinopril and hydrochlorothiazide is hypotension and pancreatic ischemia.² Only 15% of acute pancreatitis cases develop into

necrotizing pancreatitis, which has a mortality that is three times that of acute pancreatitis (17%).³ Sulindac has been implicated in numerous cases of acute pancreatitis with a latency period as long as five years between ingestion and clinical presentation.⁴ Its clinical presentation resembles gallstone pancreatitis in the

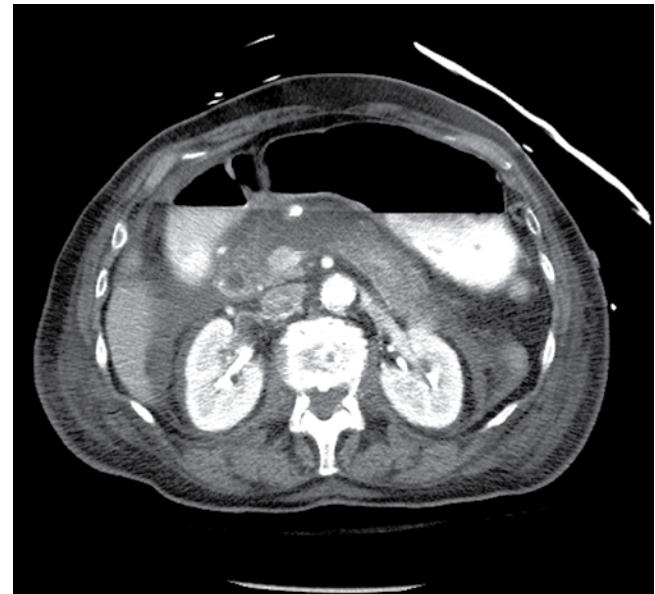


Figure 1. Computer tomography scan with intravenous contrast demonstrating necrotizing pancreatitis. New nonenhancing area in proximal body superimposed on edematous pancreas consistent with known acute pancreatitis does not indicate any discrete drainable fluid collection.

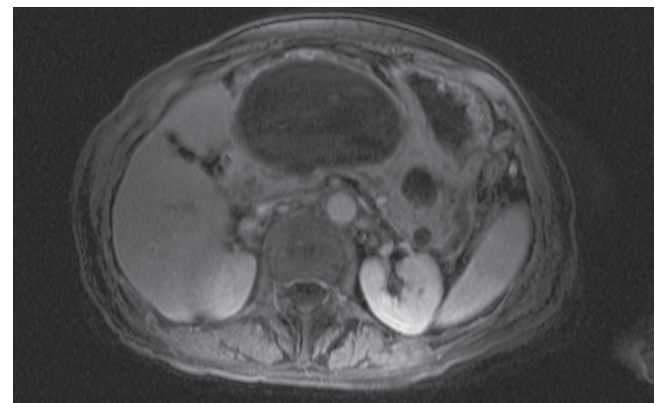


Figure 2. Magnetic resonance imaging with contrast revealing 11x7cm non-enhancing cystic lesion within the body of the pancreas corresponding to a pancreatic pseudocyst with internal debris. Additional small cystic lesions in pancreatic tail likely represent additional smaller pseudocysts and areas of pancreatic ductal dilatation.

absence of stones, which may explain the patient's biliary duct and intrahepatic dilatation on initial CT scan which is reversible with the cessation of sulindac. The proposed mechanism is sulindac metabolite deposition in biliary epithelial cells and inhibition of canalicular bile transport, leading to hypercholesterolemia.⁵

Supportive care is the main stay of treatment. The patient received IV antibiotics, IV fluids and pain medication. Other than an episode of rapid atrial fibrillation, the patient did not have any other complications. Seven days post admission the patient was discharged to home. Two weeks later, the patient returned with fever, abdominal pain, and constipation and was diagnosed with chronic pancreatitis. Imaging revealed a new 11cm pseudocyst obstructing the splenic vein and narrowing of the portal vein (Figure 2). She was treated supportively and discharged with outpatient follow-up for drainage in two to three weeks.

Gallstones, alcohol, and hypertriglyceridemia were ruled out in our patient prior to diagnosing drug-induced pancreatitis. The necrosis-fibrosis concept describes chronic pancreatitis as progressive inflammatory damage and fibrosis resulting from repeated episodes of acute pancreatitis.⁶ The majority are alcohol related, and there have been no established cases linked with medications. The literature has reported a few case reports of different medications causing fatal pancreatitis including sulindac, hydrochlorothiazide and lisinopril,^{1,4} although ours is the first case to report chronic pancreatitis in a patient on all three medications. Clinicians should consider medications in patients with gastrointestinal complaints, especially in those with pancreatitis that is not caused by gallbladder disease or alcohol use.

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Images In Medicine

Spinal Epidural Abscess

Abmad Ismail, MD, Aurora Pop-Vicas, MD, and Steven Opal, MD

INTRODUCTION

Spinal epidural abscesses (SEA) can have devastating consequences if they are not promptly diagnosed and treated¹. We present an illustrative case of advanced cervical epidural abscess in a patient with multiple emergency department visits in whom the diagnosis was not initially recognized.

CASE PRESENTATION

A 42 year old woman presented with 4 weeks of subjective fevers, intermittent chills, severe headaches, and worsening left-sided neck pain. On two prior emergency department visits, she was diagnosed with nonspecific musculoskeletal pain and torticollis, and discharged home with analgesics and muscle relaxants. On the day of admission, she was afebrile, confused, and unable to fully open her mouth. Her head was tilted to the left, and her neck range of motion was severely restricted. Motor strength and deep tendon reflexes were diminished in her bilateral lower extremities and in her left upper extremity.

Her WBC was $25.6 \times 10^3/\mu\text{L}$. A lumbar puncture showed 140 WBCs/mm³ with 80% neutrophils, glucose of 195 mg/dL, and protein of 6,029 mg/dL, suggesting a parameningeal abscess with secondary spinal fluid block. Cervical spine MRI showed a large retropharyngeal abscess extending from the posterior oropharynx to C4 (Figure A), an epidural abscess extending from C1 to C3 with some displacement of the spinal cord, and abnormal cord signal from C6 to T1

consistent with myelitis (Figure B). Multiple blood cultures grew methicillin-resistant *Staphylococcus aureus* (MRSA). The patient and her family refused neurosurgical intervention, and she was treated with 8 weeks of parenteral antibiotics. At discharge, she was ambulatory with assistance, and had



Figure B. The white arrow represents epidural abscess and spinal cord compression.



Figure A. The white arrow represents a large retropharyngeal abscess.



Figure C. Follow up MRI done three months later showing the complete resolution of the retropharyngeal abscess, epidural abscess and myelitis.

residual upper extremity weakness. A follow up neurological exam and a repeat spinal MRI (Figure C) were both normal within three months.

DISCUSSION

The classic triad of fever, back pain, and neurological abnormalities is rarely present at the time of the first medical evaluation of SEA, underscoring the need for a high index of suspicion for this rare syndrome.¹ Gadolinium-enhanced magnetic resonance imaging is the diagnostic modality of choice to confirm the presence and determine the location of the abscess.² Our patient's ultimate recovery in the absence of surgery is consistent with previous retrospective studies showing similar outcomes with medical conservative approaches versus surgical interventions.³ Nevertheless, in the absence of more solid prospective clinical trial data, emergent surgical decompression and debridement, followed by long-term antimicrobial therapy remains the treatment of choice.

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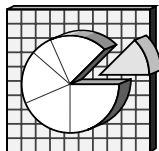
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The Impact of Rhode Island's Statewide Smoke-Free Ordinance on Hospital Admissions and Costs for Acute Myocardial Infarction and Asthma

Cynthia Roberts, PhD, Paul Jordan Davis, Kathleen E. Taylor, and Deborah N. Pearlman, PhD

A GROWING NUMBER OF STUDIES IN THE UNITED STATES AND other countries, and two meta-analyses, have demonstrated a decrease in the incidence of **acute myocardial infarction (AMI)**^{1,2,3,4,5,6,7,8,9,10} and asthma^{4,10,11} following the implementation of comprehensive smoking bans. These studies show a decrease in AMI admissions ranging from 8% to 40%, varying with the study design and methods. A statewide smoking ban in Arizona resulted in a 22% reduction in asthma hospital admissions in the year after implementation.⁴

In March 2005, Rhode Island implemented the Smoke Free Public Places and Workplaces Act,¹² a comprehensive statewide ban on smoking covering all enclosed public places of business, such as restaurants and bars, healthcare facilities, shopping areas, and offices. We used hospital discharge data to determine whether Rhode Island's statewide smoking ban reduced hospital admission rates and associated costs for AMI and asthma.

METHODS

Our analyses focused on adult admissions to one of Rhode Island's 11 acute care general hospitals where AMI (ICD-9-CM 410.xx), asthma (ICD-9-CM 493.xx), and appendicitis (ICD-9-CM 540.xx to 543.xx) were listed as the principal diagnosis. Patients under age 18 and out-of-state residents were excluded from analysis. We selected appendicitis as the control condition, as no known relationship exists between this condition and exposure to secondhand smoke. Age-adjusted hospitalization rates and 95% confidence intervals were calculated for each condition. The potential impact of the statewide smoking ban was examined in the two years immediately following the ban (Phase I: 2006-2007) and an additional two years after this period (Phase II: 2008-2009) to look for any sustained reductions in hospital admissions for AMI and asthma relative to the two years before implementation (2003-

2004). Rhode Island's Hospital Discharge Data set also contains information on the total charges incurred for each patient's stay. The charges were multiplied by a cost factor ratio specific to each hospital in order to estimate costs or the amount reimbursed by health plans for hospital-based services. The total reimbursable costs were adjusted for inflation using 2009 as the reference year.¹³ The percentage change (increase or decrease) in the total amount reimbursed for AMI, asthma, and appendicitis-related claims was calculated using the formula: $((\text{Time 2} - \text{Time 1}) / \text{Time 1}) * 100$. We used this information to see if there were any changes in AMI and asthma costs that might be attributable to the statewide smoking ban. We ran the analyses with SAS software version 9.

Table 1. Trends in age-adjusted hospital admission rates per 10,000 population for acute myocardial infarction, asthma, and appendicitis among Rhode Islanders 18 years and older, before and after implementing a statewide smoke-free ordinance, 2003-2009

	AMI ¹	Asthma ²	Appendicitis ³
Year	Rate (95% CI) ⁴	Rate (95% CI)	Rate (95% CI)
Pre-implementation period			
2003	35.2 (34.0 – 36.5)	11.3 (10.6 – 12.1)	7.9 (7.3 – 8.5)
2004	31.5 (30.3 – 32.7)	10.6 (9.9 – 11.3)	8.7 (8.1 – 9.3)
Implementation period			
2005	30.6 (29.4 – 31.8)	12.8 (12.0 – 13.5)	9.5 (8.8 – 10.2)
Phase I: post-implementation period			
2006	28.1 (27.0 – 29.2)	12.0 (11.3 – 12.8)	9.3 (8.6 – 9.9)
2007	25.2 (24.2 – 26.3)	12.0 (11.2 – 12.7)	10.0 (9.3 – 10.7)
Phase II: post-implementation period			
2008	25.4 (24.3 – 26.4)	12.6 (11.8 – 13.3)	9.8 (9.1 – 10.5)
2009	23.1 (22.1 – 24.1)	13.5 (12.8 – 14.3)	8.5 (7.9 – 9.1)

1. Principal hospital admission for acute myocardial infarction (AMI), based on International Classification of Diseases, Ninth Revision codes (ICD-9-CM) 410.xx

2. Principal hospital admission for asthma, ICD-9-CM 493.xx

3. Principal hospital admission for appendicitis, ICD-9-CM 540.xx to 543.xx

4. CI = confidence interval

Data source: Rhode Island Hospital Discharge Data, Rhode Island Department of Health, Center for Health Data and Analysis.

Table 2. Trends in reimbursed hospital costs for acute myocardial infarction, asthma, and appendicitis among Rhode Islanders 18 years and older, before and after implementing a statewide smoke-free ordinance, 2003-2009

	AMI ¹ Total reimbursed costs ⁴ (n) ⁵	Asthma ² Total reimbursed costs (n)	Appendicitis ³ Total reimbursed costs (n)
Pre-implementation			
2003	\$44,789,782 (n = 3,062)	\$4,718,725 (n = 946)	\$4,215,489 (n = 641)
2004	\$43,623,639 (n = 2,745)	\$4,689,029 (n = 898)	\$4,821,033 (n = 785)
Implementation			
2005	\$44,681,044 (n = 2,664)	\$5,824,679 (n = 1079)	\$4,433,957 (n = 770)
Post implementation Phase I			
2006	\$41,093,607 (n = 2,454)	\$4,820,307 (n = 1,025)	\$4,457,597 (n = 749)
2007	\$37,138,862 (n = 2,220)	\$5,327,521 (n = 1,023)	\$4,975,899 (n = 795)
Post implementation Phase II			
2008	\$37,863,172 (n = 2,261)	\$6,039,936 (n = 1,074)	\$5,219,772 (n = 781)
2009	\$38,228,437 (n = 2,085)	\$7,319,811 (n = 1,171)	\$4,792,242 (n = 678)
Percentage change Pre-implementation (2003) to end of Phase I (2007)	-17.1	+12.9	+ 18.0
Percentage change Pre-implementation (2003) to end of Phase II (2009)	-14.6	+55.1	+13.7

1. Principal hospital admission for acute myocardial infarction (AMI), based on International Classification of Diseases, Ninth Revision codes (ICD-9-CM) 410.xx

2. Principal hospital admission for asthma, ICD-9-CM 493.xx

3. Principal hospital admission for appendicitis, ICD-9-CM 540.xx to 543.xx

4. The amount reimbursed for hospital based services by health plans adjusted for inflation.

5. n = number of hospital admissions.

Data source: Rhode Island Hospital Discharge Data, Rhode Island Department of Health, Center for Health Data and Analysis.

RESULTS

Table 1 shows the annual age-adjusted hospitalization rates for AMI, asthma, and appendicitis (per 10,000 population) for two years prior to and four years after the implementation of Rhode Island's statewide smoking ban. The largest reduction in AMI hospitalization rates was seen between 2003, when the rate was 35.2 per 10,000 population (95% CI 34.0 – 36.5), and 2009, when the rate was 23.1 per 10,000 population (95% CI 22.1 – 24.1), a full four years after the ban prohibiting smoking in public places took effect. There was a significant increase in hospitalization rates for asthma between 2003 (11.3; 95% CI 10.6 – 12.1 and 2009 (13.5; 95% CI 12.8 – 14.3), but no change in the hospitalization rate for appendicitis over this time period (2003: 7.9; 95% CI 7.3 – 8.5; 2009: 8.5; 95% CI 7.9 – 9.1).

Table 2 shows the number of hospital admissions and total reimbursed costs for each diagnosis during three periods—prior to the smoking ban, during the first post-implementation

phase, and during the second post-implementation phase. During the first post-implementation phase, there was a reduction in the number of admissions for AMI and a 17.1% decrease in total costs between 2003 and 2007. This represented a potential savings in hospital costs of over seven million dollars. A modest drop in the number of admissions for AMI occurred between the period immediately following the ban and the second post-implementation phase; however, a 14.6% reduction in total costs associated with AMI occurred between 2003 (two years before the ban was implemented) and the end of 2009, with a potential savings of over 6 million dollars.

We observed an increase in the number of admissions for asthma and a 55% increase in total costs between the pre-implementation phase and the end of the ban's second phase in 2009. The study period saw a modest increase in both the number of admissions and total costs for appendicitis, with an 18% increase in total costs between 2003 and the first period following the ban (2007), and a 13.7% increase in total costs between 2003 and the second period following the ban (2009). We did not expect exposure to secondhand smoke to affect appendicitis admissions and costs.

DISCUSSION

A number of recent studies have demonstrated reductions in hospital admissions for AMI after the implementation of a smoking ban.¹⁻¹⁰ Our study showed a reduction in age-adjusted hospitalization

rates for AMI after the implementation of a statewide comprehensive ban on indoor smoking, with a 17% reduction in AMI-specific hospitalization rates in the first post-statewide ban period (2006-2007). A strength of this study is that we assessed the potential effects of the ban in the two years immediately following its implementation and at one later time point, which showed sustained decreases in AMI hospitalization rates and associated costs.

Unlike other studies,^{4,10,11} however, we did not find that asthma hospitalizations rates decreased. The severity of the recent economic crisis in Rhode Island likely amplified factors associated with asthma exacerbations, such as poverty and poor housing quality.¹⁴ These factors may have contributed to the increase in hospital admissions for asthma.

As with any study there are limitations to the data. Rhode Island's Hospital Discharge Data do not include biomarkers for exposure to secondhand smoke or whether patients admitted to the hospital are smokers. As such, we do not know what propor-

tion of the decrease in AMI hospitalization rates is attributable to the decrease in exposure to secondhand smoke by non-smokers. Caution should be taken when interpreting the asthma and appendicitis results given that admissions numbers for these two conditions were relatively small compared to AMI admissions.

At least three policy and practice implications are relevant given the demonstrated effectiveness of statewide smoking bans on cardiovascular disease outcomes. First, physicians should advise all patients with cardiovascular disease, and especially those with coronary heart disease, to avoid indoor areas that permit smoking.^{7,15} Second, with hookah bars becoming more prevalent in Rhode Island, physicians should warn patients and educate decision makers of the cardiovascular health dangers caused by active smoking and secondhand smoke in these indoor establishments. Finally, managers and residents of both private and public multi-unit housing should join the growing movement in Rhode Island to pass comprehensive smoke-free housing policies, as achieved by the Providence Housing Authority in the spring of 2011.

The results of our study add to the growing number of other studies showing concrete cardiovascular health benefits and potential health care cost savings gained by implementing a statewide ban on indoor smoking. Our findings may prompt other states to join the growing list of 35 U.S. states benefiting from smoke-free laws.¹⁶

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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). Each submission should also be accompanied by a short (100-150 words) abstract.

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

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Authors discuss new treatments. Maximum length: 1200 words.

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

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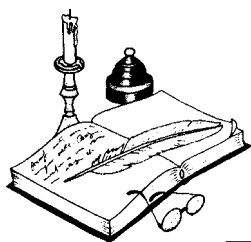
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Physician's Lexicon

The Rh Words of Medicine

RHO, THE 17TH LETTER OF THE CLASSICAL Greek alphabet, is derived earlier from the Semitic, *resh*; and when it is transcribed to words in contemporary English, it often includes the *rh-* combination of glyphs. A handful—a rhetorical, rhapsodic handful, perhaps—are of medical importance.

Rheum, a noun describing a fluid discharge from the mucous membranes, is derived from the Greek, *rheuma*, meaning that which flows, a flux. A family of words stem from it, including rheumatism, rheumatoid and rheumatology, a major branch of medicine that includes the various forms of arthritis.

Rhino-, from a Greek word for nose, has given birth to medical terms such as rhinencephalon, the olfactory segment of the forebrain; rhinocephaly, a form of neural birth malformation; rhinalgia, pain in the nose; rhinolalia, a nasal distortion of speech (*lalein*, Greek, to stutter, to prattle); and, of course, rhinoceros, the tropical

beast, (*ceros*, from Greek, meaning horn or thickened skin.)

Rhabdo-, from a Greek root meaning rod (as in rhabdomania, divination with a rod and rhabdophobia, a fear of a whipping rod). This root, when linked to *myo-*, a Greek root meaning muscle or mouse, creates the complex root meaning striated muscle, with such words as rhabdomyoma and rhabdomyolysis.

A rhonchus, from the Greek, *rhonkos*, defines a snoring sound.

The Greek root, *rheo-*, meaning a stream or current, gives rise to words such as rheostat, rheotropism and rheometry, the measurement of blood flow by electrical instruments. And then, as a suffix, *-rrhea*, it creates such words as diarrhea, rhinorrhea, gonorrhea and logorrhea.

The Rh factor defines an immunogenic blood antigen first noted in 1939 by Philip Levine and Rufus Stetson and then fully explored by Alexander Wiener and Karl Land-

steiner in 1940. The name is derived from *Rhesus macaque*, a primate whose blood was employed to yield the Rh factor.

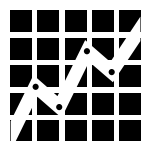
The combining form, *rhizo-* is from the Greek meaning root or branch. Most words containing this root are of botanical origin such as rhizome, Rhizopus and rhizophagous. Rhizotomy is a medical term defining the cutting of spinal nerve roots.

The root, *rhodo-*, generally refers to the color rose, as in rhodomycin, rhodogenesis, rhodium (the salts of which are reddish in color) and even rhododendron.

Not to be forgotten are such additional *rh-* words as rhubarb, rhetoric, rhea, rhenish and of course, Rhode Island.

And for the very erudite, there was the demigod Rhadamanthus, son of Zeus and Europa, and one of three Hellenic judges of the dead (the other two, Minos and Aiakos.)

— STANLEY M. ARONSON, MD



RHODE ISLAND DEPARTMENT OF HEALTH
MICHAEL FINE, MD
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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			
	January 2011	12 Months Ending with January 2011		
Diseases of the Heart	Number (a) 235	Number (a) 2,291	Rates (b) 217.5	YPLL (c) 3,294.5
Malignant Neoplasms	191	2,301	218.5	5,991.5
Cerebrovascular Diseases	44	455	43.2	727.0
Injuries (Accidents/Suicide/Homicide)	52	625	59.3	9,839.0
COPD	54	517	49.1	445.0

Vital Events	Reporting Period		
	July 2011	12 Months Ending with July 2011	
	Number	Number	Rates
Live Births	1,041	11,724	11.1*
Deaths	791	9,956	9.5*
Infant Deaths	(9)	(67)	5.7#
Neonatal Deaths	(6)	(64)	5.5#
Marriages	842	6,181	5.9*
Divorces	256	3,350	3.2*
Induced Terminations	320	4,073	347.4#
Spontaneous Fetal Deaths	47	630	53.7#
Under 20 weeks gestation	(38)	(546)	54.8#
20+ weeks gestation	(9)	(82)	7.0#

(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, JANUARY, 1922

Noting that acute appendicitis is the most common surgical disease of the abdomen, Charles O. Cooke, AM, MD, further points out that no paper on the subject has been presented to the medical society in the past fifteen years. He urges all physicians to have a thorough understanding of the diagnosis, having observed an increase in the number of neglected cases coming under observation—particularly in hospital practice. He goes on to discuss early diagnosis. He concludes with a summary of suggestions and a plea for more careful study of acute abdominal cases.

George W. Gardner, MD, discusses surgery in diabetics, dividing the subject into two classes. The first including all surgical conditions not due to the disease, although often influenced by it, and the second being conditions commonly believed to be due to the disease. He highlights traumatism and infection in the first case, and carbuncles and gangrene in the second.

Arthur T. Jones, MD, FACS, presents a case report on traumatic rupture of the urinary bladder. The case involved a fifteen year old girl involved in a traffic accident in whom an x-ray revealed (in addition to several lacerations along the anterior bladder wall) a complete fracture of the horizontal portion of the left pubic bone; a fracture of ramus of the ischium, and a fracture of the ilium straight down to the great sacrosciatic foramen. While recovery was slow following surgery, the patient eventually showed signs of improvement with the aid of catheters and gauze packing in the pre-vesical space. The patient was able to walk out of the hospital approximately 60 days later. Among the points which the author credits the recovery are allowing patient to get over initial shock, rapid operation, and establishing constant drainage through self-retaining catheter and quickly controlling hemorrhage from the front of the bladder with gauze packing.

This issue of the journal contains a questionnaire which was also sent out to over 40,000 physicians regarding the use of alcohol as a therapeutic agent. The second question reads: "A.) Do you regard whisky [sic] as a necessary therapeutic agent in the practice of medicine? Yes. No. B.) If "yes," in what diseases or conditions do you regard whisky as necessary?"

FIFTY YEARS AGO, JANUARY, 1962

This issue is largely devoted to the publication of various papers presented at the New England Blue Shield Professional Relations Seminar held on September 22, 1961. The editors state: "While this Journal may take strong issue with some of the views expressed, these essays are nevertheless sufficiently provocative to justify making them available to the profession at large. We are doing so for the information of our readers and as a service to them. We urge that they be read carefully and thoughtfully."

Pascal F. Lucchesi, MD, of the Albert Einstein Medical Center in Philadelphia discusses the uses and abuses of Blue Cross.

Among the small abuses he has observed is the tendency of Blue Cross patients to stay in the hospital longer than non-Blue Cross patients, and while this may seem a small matter, it adds up in cost which have an impact on rates and care for all.

This issue includes the first of a two-part analysis the Reverend Stanley Parry, CSC, PhD, of the University of Notre Dame regarding the King-Anderson Bill (H.R. 4222) brought before Congress which addresses financing certain limited medical care for the aged through Social Security. He examines whether or not the indigent aged qualify as a class or group, and then looks at how indigent dependency is defined. He concludes this part of the analysis by offering that the indigent and dependent aged are not a large enough group to justify a widespread policy, and that the poverty approach is not tenable. He suggests that "the evidence in favor of a change of policy is so meager as to compel the conclusion that the desire to change is rooted in a sheer option, in a stark will to handle the matter this new way instead of the old way.

TWENTY-FIVE YEARS AGO, JANUARY, 1987

This issue opens with an editorial discussion on the AIDS epidemic—particularly the history of reports starting with the first published identification of the acquired immune deficiency syndrome found in the June 5, 1981 issue of *Morbidity and Mortality Weekly Report* prepared by the US Centers for Disease Control, followed by another report a month later in the *MMWR* connecting AIDS to the presence of Kaposi's Sarcoma. The piece goes on to look at the increasing cases over the next five years, noting that in addition to homosexual victims, AIDS also appeared among intravenous drug abusers and infants of women who were intravenous drug abusers. By the end of 1985, the CDC registry of AIDS patients included 16,227 adults and 231 children.

The Rhode Island Blood Center's Ronald A. Yankee, MD, and Charles P. Mosher discuss how blood banks unwittingly become vectors in the transmission of HIV. They further discuss methods of antibody testing and of characteristics of donors positive for HIV. They conclude with an outline of current procedures to safeguard the blood supply from AIDS and the need for a test that would recognize HVI antigen rather than antibody.

Alvan E. Fisher, MD, presents a patient-oriented review of clinical manifestations of AIDS. He presents four patients—three homosexual white males and one bisexual white male) and presents a timeline of symptom manifestation for each along with information on complications, opportunistic infections, and secondary malignant tumors.

Additional articles in this issue discuss possible therapeutic strategies, the absence of a vaccine, and methods of control of the spread of HIV.

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KEY:

CC:	Creative Clinician Case
GPP:	Geriatrics for the Practicing Physician
HBN:	Health by Numbers
IM:	Image in Medicine
PL:	Physician's Lexicon
QC:	Quality Care & Patient Safety for the Practicing Physician

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