vestigator or the sponsor. Again, we believe that such assessments require consideration of the entire safety database, to which any individual investigator would lack access. The FDA is working with international regulators to develop strategies to harmonize safety-reporting requirements.

To implement this regulation, IND sponsors will need to adopt systematic approaches to safety surveillance and monitoring. Published reports and public presentations have indicated that many such systems already exist or are under development.[3] These systems should provide the capacity to review and evaluate accumulating data on serious adverse events from all trials of an investigational drug. A draft FDA guidance document accompanying the new rule describes the use of data monitoring committees, or similarly constituted sponsor safety groups, to perform this function.[4]

Although the new rule focuses on serious, unexpected suspected adverse reactions, IND sponsors are expected to monitor all adverse events, including nonserious ones, during drug development.

Ultimately, this new rule will increase the interpretability and usefulness of safety data available to the clinical investigators, IRBs, and the FDA. These groups will receive fewer individual reports, and the reports should be more complete and meaningful. Thus, the rule will enhance patient protection, ensure regular and thorough evaluation of serious adverse events, and therefore generate better data to support clinical decision making. The FDA recognizes that implementing this new approach will be challenging. However, this effort is critical to the FDA's public health mission, which includes promoting effective and efficient development of novel drug therapies while ensuring the highest level of patient protection.

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Lessons from the Trenches — A High-Functioning Primary Care Clinic

Thomas Bodenheimer, M.D.

Clinica Family Health Services is a community health center serving a low-income, largely Latino population near Denver. Since its inception 30 years ago in founder Alicia Sanchez's kitchen, Clinica has grown to serve 40,000 patients at four sites. Fifty percent of these patients are uninsured; 40% have Medicaid. Like many community health centers, Clinica is financed by augmented Medicaid fees, federal grants, sliding-scale payments from uninsured patients, and energetic local fundraising.

Clinica's story reveals that U.S. primary care is undergoing two revolutions. The first, catalyzed by the Chronic Care Model, targets specific diseases such as diabetes or asthma. The second, coming on the heels of the first, entirely transforms primary care delivery. Starting in 1998, Clinica was an activist in the first primary care revolution with its work on diabetes. After 2000, Clinica initiated the second revolution, redesigning its entire care model to become a patient-centered medical home. Clinica's experience demonstrates how such medical homes can be constructed out of three fundamental building blocks — continuity of care, prompt access to care, and care provided by teams — and the ways in which primary care practitioners (physicians, nurse practitioners [NPs], and physician assistants [PAs]) adapt to the resulting changes in their work life.

Clinica's medical director, family physician Carolyn Shepherd, grasped early on that continuity of care between patients and their primary care practitioner is asso-

ciated with better preventive and chronic care, improved experiences for both patient and practitioner, and lower costs.[1] Implementing a culture of continuity requires that patients be assigned to the panel of a specific practitioner, who is available most days of the week. These clinicians must be willing to squeeze their patients — but not other clinicians' patients — into their schedules if same-day attention is needed. Staff members answering the phone must prioritize such continuity.

If achieving continuity is like climbing a 5000-ft mountain, sustaining prompt access to care is like scaling one of Colorado's 14,000-ft peaks. For 10 years, Clinica has provided most appointments within 6 days of patients' requests, and usually within 2 days. Clinica fills primary care practitioners' schedules from 8 a.m. to 10 a.m., leaving many slots for same-day access. Staff members who answer the phones are not allowed to say no to patients, whose requests are addressed with appointments, "squeeze-ins," or visits with a registered nurse (RN). Schedules are created for only 2 weeks at a time, to ensure that appointment slots will remain open. If clinicians request appointments for their patients beyond the next 2 weeks, electronic reminders generate calls to those patients on the appropriate date.

Adequate access requires an equilibrium between demand for visits and capacity to provide them. At Clinica, this balancing act is accomplished by eliminating unnecessary demand and adding capacity. Continuity of care reduces demand because if patients see other clinicians, an additional appointment is often scheduled with their own clinician for the same problem.[2] Demand is also reduced by increasing the intervals between visits, which has been shown in most cases not to harm the quality of care.[3] Capacity is increased by offering patients visits with RNs for less complex problems and through group visits, which allow clinicians to see 30 to 40% more patients per hour.

Embracing continuity and improved access requires clinicians to accept a truly patient-centered approach to care: to see patients most days of the week, to cede to their patients control over their daily schedules, and to be willing to see their own patients who drop into the office and not expect other clinicians to do so. Why might clinicians agree to such changes in their work life? Clinica's practitioners have accepted the priorities of continuity and access partly because persuasive medical leaders had the courage to say "this is the way it's going to be," partly because they see these policies benefiting their patients, and recently because Clinica has been recruiting new clinicians who already agree with these principles.

Clinica has moved boldly from a doctor-based model to a team-based model.[4] All clinical activity centers around the "pod" (care team), which includes at one location three primary care practitioners and three medical assistants (MAs, each working with a single clinician), plus an RN, a case manager, a behavioral health professional, and medical-records and front-desk staff. Clinicians don't have their own offices; each pod has a central area surrounded by exam rooms. Pod members easily interact with one another and can see all patient rooms, whose doors are marked with colored flags showing who is inside. In each pod, performance data are displayed on a wall, and any deficiencies are discussed at team "huddles." Clinica's quality of care often exceeds national Medicaid performance (see table) — especially impressive given that Clinica's data include the 50% of its patients who have no insurance.

Every team member shares responsibility for the team's patients. MAs take histories using electronic medical record (EMR) templates and give immunizations according to protocols, without involving physicians, NPs, or PAs. Designated team members handle most preventive and much chronic care through panel management — combing registries and arranging for patients who are found to be overdue for mammograms, colorectal cancer screening, or diabetes laboratory work to receive these services. RNs, using standing orders, treat patients with ear infections or positive streptococcal, urine, gonorrhea, or chlamydia cultures and manage warfarin dosing — all without involving primary care practitioners, who sign off later in the EMR. As much as possible, clinicians spend their time providing complex diagnosis and management, with routine functions performed by other team members. Only through a team approach can primary care, with its clinician shortage, meet population-wide needs.

To make the transition to team care, Clinica reconfigured hundreds of workflows, detailing who would do what and how, for such functions as receiving incoming phone calls, updating clinician schedules, informing patients of

Clinica's Performance Data (as Compared with Average 2009 HEDIS Scores for All Medicaid Health Plans, Where Available).*

Metric	2006	2008	2010	2011 (Year to Date)	HEDIS Medicaid, 2009
Continuity for patients with diabetes					
With primary care practitioner (%)	58	63	69		
With team (%)	82	79	85		
Access					
Time to third available appointment (days)	6	5	4	4	
Prenatal care					
Entry to care during first trimester (%)	66	59	80	83	83
Low birth weight (%)	6	6	6	6	
Cesarean section (%)		20	20	20	
Pap test in past 3 yr (% of women 24–64 yr of age)		77	83	84	
2-yr-old immunizations (%)		63	81	92	
Patients with diabetes					
Glycated hemoglobin <7% (%)		34	40	41	34
Glycated hemoglobin >9% (%)		22	21	23	45
Patients with hypertension					
Blood pressure <140/90 mm Hg (%)		56	67	68	60

* Clinica's total number of medical visits in 2010 was 145,596. HEDIS denotes Healthcare Effectiveness Data and Information Set (www.ncqa.org), and Pap Papanicolaou. Nationally, the percentage of births with low birth weight among Hispanics in 2008 was 7.0%; the national cesarean section rate among U.S. Hispanics in 2007 was 30%.

laboratory results, and refilling prescriptions. For common clinical conditions and well-child care, specific workflows were created and job roles were redefined using standing orders, with the goal of standardizing guideline-driven care while dividing responsibility among team members.[5]

Team-based care requires fundamental changes in clinicians' mindset. Many practices claim to have teams, but the physician provides all care and delegates specific tasks (fax this form, do an EKG) to others. At Clinica, the entire team shares responsibility for the health of the patient panel. Entire work areas, though overseen by an MD, NP, or PA, are performed independently by RNs, MAs, or case managers. For clinicians to accept this shift from "I" to "we," team members must have their roles authorized through protocols and be trained to perform them competently. Clinicians must have confidence that all team members are doing a good job in order to feel relief that they have time for more complex tasks.

Clinica will next focus on controlling costs by reducing unnecessary emergency department visits and hospital admissions. Achieving this goal will require a deepening of team care, with care managers assisting patients who have complex, high-cost conditions. This step awaits a new funding stream, which requires participation in an accountable care organization in which Clinica will share the savings from reduced downstream costs.

Clinica has confronted basic primary care challenges and answered key questions: How can continuity of care be made the centerpiece of a medical practice's ethos? Can a policy of providing prompt access be sustained? Who should be included in care teams, who should perform which work, and how central to team function are colocation, workflows, and standing orders? How should care for common conditions be standardized?

Ultimately, clinicians' acceptance of the primary care revolutions will be sustainable only if their work life is more satisfying than it was before. Understanding that necessity, Clinica's leaders have created an organization that serves patients well while retaining a group of loyal clinicians.

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BECOMING A PHYSICIAN

Level IV Evidence — Adverse Anecdote and Clinical Practice

Alison M. Stuebe, M.D.

When I entered medical school in 1997, I joined a generation of doctors that was supposed to practice evidence-based medicine. First in small groups, and later during clinical rotations, we learned to interpret the medical literature and apply the conclusions of randomized, controlled trials to our clinical decision making. Working within this new paradigm, we were going to rise above the apprentice-based training of our forbears and make decisions on the basis of gold-standard, Level I evidence.

When I started residency, I remember proudly stating my intention to help move obstetrics into the world of evidence-based medicine. During my intern year, I memorized the results of Mary Hannah's Term Breech,[1] Term PROM,[2] and Postterm[3] randomized trials. At board rounds, my fellow interns and I would recite the sample size and key findings of each study. These studies were the gold standard, superior to Level II observational studies and Level III expert opinion. We were determined to manage our patients' care on the basis of data, not dogma.

During a decade of practicing obstetrics, I've continued to try to rely on Level I evidence when making clinical decisions. But real life has intruded on the carefully catalogued odds ratios that I memorized as an intern. I've come to appreciate that the influence of a randomized, controlled trial — no matter how well conducted or generalizable — pales in comparison with that of the audible bleeding of a profound postpartum hemorrhage. As I tell residents and fellows, in the human mind, adverse anecdote — what I've come to call Level IV evidence — is more convincing than even the tightest of confidence intervals.

The part of me that aspired to higher-order, data-based thinking often despairs to realize that I seem to treat patients on the basis of a personal case series. I am supposed to be a clinical scientist. I should be smarter than this.

But the instinct that drives us to act on the basis of Level IV evidence dates far back into our evolutionary history. Neuroscientists have demonstrated that strong emotions modulate learning and memory.[4] Indeed, the administration of stress hormones during a learning task improves retention weeks later. It stands to reason, then, that adverse personal experience will create more compelling memories than reading a Cochrane review.

That's why, when I take a resident through a cesarean section, I have an adverse anecdote to share for every step of the operation. Taking down the rectus from the fascia brings back the time my team lacerated the small bowel of a primiparous women with a prior myomectomy. The uterine incision cues the memory of the night I cut into the infant's cheek during an emergency C-section performed under general anesthesia because of repetitive late decelerations. And I always pause when we irrigate the cul de sac, checking for a potentially fatal retroperitoneal hematoma.

Randomized, controlled trials may be the gold standard, but their results can take decades to make their way from the pages of peer-reviewed medical journals to actual effects on routine care.[5] Adverse anecdote can transform a clinician's practice patterns in an instant.

I used to think that I needed to resist Level IV evidence — I believed that I could, through sheer willpower, force my brain to place more weight on the meta-