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Supplemental Appendix. Contextual Factors at Group Health

This appendix details the contextual factors at Group Health that we believe are relevant for understanding and transporting findings from "Spreading a Medical Home Redesign: Effects on Emergency Department Use and Hospital Admissions."

Group Health Cooperative and the Organization of Primary Care
Started in 1946, Group Health Cooperative is an integrated delivery system that provides health care insurance and delivers health care. Approximately 10% of Washington State residents have Group Health insurance. Currently, Group Health provides health insurance across a range of products including commercial plans (for small, medium, and large employers), Medicare Advantage plans, a state Medicaid plan, a state-subsidized health insurance program for low-income residents (called Basic Health), and a variety of individual and family plans. In the commercial market, Group Health offers a traditional health maintenance organization (HMO) product (with restricted choice of clinician), as well as a variety of products that give patients a choice, including point-of-service (POS) plans and preferred provider organization (PPO) arrangements.
Primary care physicians in the integrated group practice work in 26 owned and operated clinics that have on-site pharmacies, laboratories, and radiology suites. (One clinic closed after this study.) The clinics are located across the state of Washington and are concentrated in its population centers. The enrolled populations at the clinics vary by more than 7-fold in size from approximately 6,000 patients in a small rural clinic to 44,000 in a large urban one.
Patients with Group Health insurance are enrolled in either Group Health's integrated group practice (where care is delivered in a variety of owned and operated facilities or through contracted arrangements) or in a network of community providers. This study focused on the implementation of the patient-centered medical home (PCMH) in the integrated group practice, using the community network to adjust for secular trends.
Most primary care physicians who are employed at Group Health are family physicians. At the beginning of this study, primary care physicians included 82% family physicians, 3% general internists, and 15% general pediatricians.
In its integrated group practice, Group Health has a long history of empaneling all patients to primary care physician who work in teams involving physician assistants, registered nurses, clinical pharmacists, licensed practical nurses, and medical assistants. The staffing ratios for these teams (before and after the PCMH implementation) has been described elsewhere.[1] A main goal of the PCMH implementation was to reduce panel sizes to approximately 1,800 to 2,000 patients (full-time equivalency and case mix adjusted) by hiring more physicians and leveling physician panels. This objective has been accomplished by periodically opening and closing panels, and shifting patients from overpaneled physicians to new or underpaneled physicians.[2]
Primary care physicians at Group Health are not compensated by fee for service or compensation. Rather, they are paid by salaries at levels that are generally competitive in the local market. Group Health has an incentive pay program, the composition of which varies over time, but provides incentives based on patient satisfaction with care scores, meeting quality of care targets, and resource stewardship (eg, use of high-use imaging that is not recommended).

Group Health successfully implemented a systemwide electronic health record (EHR) (Epic) in 2002. Described elsewhere,[3,4] the EHR features a Web portal that allows patients to schedule appointments, send secure messages to their care teams, reorder and manage their medications, review portions of their record (eg, laboratory results, after-visit summaries), receive reminders for recommended care, check their insurance benefits, and receive a personalized assessment of their health risks and recommended actions. During the course of the study period, several large upgrades and new modules to the EHR were implemented. In particular, Group Health implemented Epic's practice management software in 2009 (to complement its core ambulatory EHR) for use in scheduling appointments, registering patients, and billing.

The Medical Neighborhood at Group Health

The primary care clinics are supported by 10 systemwide specialty and behavioral health units, 6 urgent care centers, and 7 acute care hospitals (6 contracted general hospitals and 1 owned and operated maternity hospital). Where specialty or hospital care in the group practice is not available, primary care physicians refer to a variety of contracted specialty groups and other hospitals.

Primary care teams are also supported by a 24-hour telephone consulting nurse service. Using standardized protocols and with access to the EHR, nurses in this service provide advice for acute problems and direct patients back to their primary care teams, urgent care facilities, or emergency departments as appropriate.

In addition to the consulting nurse service, the primary care teams are also supported by a group of nurse case managers who provide short-term, focused interventions for complex patients. This program was in existence throughout Group Health for the duration of the study period. These nurse case managers are managed by Group Health's health plan and work alongside care teams in the 26 clinics. In this service, telephonic advice, focusing on self-management and patient engagement is provided to complex patients who are identified by predictive models, clinician referral, or patient self-referral, or during hospital discharge planning.

In addition to complex case managers, Group Health also deploys case management nurses for patients with heart failure where nurses work with individualized medical treatment plans and standing orders to manage at-risk patients. Group Health has an anticoagulation management service (AMS) that specializes in the management of warfarin, enoxaparin, erythropoietin, and bridge therapy. Through referral and using anticoagulation-dosing software, the AMS team assesses therapy compliance and monitors laboratory results to advise patients about dosage changes and next blood draws per approved protocols. Primary care teams are also supported by a wound care nursing service.

Group Health's Strategic Objectives and Improvement Methodology

In 2007, Group Health developed a 5-year strategic plan that covered the time frame of this study. The strategic plan focused on expanding enrollment and attracting members to the integrated group practice, meeting industry-standard quality of care benchmarks, achieving favorable and affordable trends in clinical expenses, and making Group Health a desirable place to work.

In 2007, Group Health also adopted the Lean Production System as its central method to improve value and eliminate waste. Group Health leaders opted to use Lean to implement and standardize the PCMH care processes across the clinics, on the basis of the strategies used at an earlier prototype clinic.[1] Group Health's Lean approach focuses on using the knowledge of front-line workers to map care processes (using current and future state maps) to eliminate waste and ensure consistent quality, timeliness, and positive customer experiences. Front-line workers are brought together to analyze workflows and in problem solving and process improvement; managers at the clinics apply standard management practices and tools—A3 thinking, visual display systems, root cause analysis, Plan, Do, Check, Act/Adjust (PDCA) cycles—to improve quality and reduce waste. Group Health's Lean approach generally starts with a Rapid Process Improvement Workshop (RPIW) that brings together representatives from all job roles responsible for the primary care "value streams" that were characterized at the prototype clinic. After grouping the changes into change modules for the PCMH,[1] the RPIW used Lean tools to redesign the work processes, which were then disseminated as "standard work" systemwide. These standards were then monitored and tracked visually by local teams and their managers. When issues were identified, root cause analyses were conducted, and contingency plans were deployed. This highly structured and

systematized spread of the PCMH change modules has been described in detail elsewhere.[1] Lean methods continue to be used as the main improvement methodology across Group Health, including in primary care.

Changes in Patient Enrollment at Group Health

Over the course of the study, there was sizable growth in the number of patients with Group Health insurance. Group Health's total enrollment increased 19% from approximately 531,000 in December 2007 to 632,000 in December 2011. Most of the growth occurred in new insurance products offering choices introduced by Group Health's health plan. Enrollment in the integrated group practice increased from approximately 388,000 to 427,000 members (9.8%) with the majority of the growth occurring in calendar year 2010. No new facilities were built during this time; enrollment increases were absorbed into the existing clinics. Although enrollment increased at all clinics, some clinics witnessed much larger growth in their enrollment than others (range, 2%-44%).

Reasons underlying this growth in Group Health enrollment are multifactorial and included the introduction of new insurance products that were responsive to greater numbers of individuals and employers, improved premium affordability relative to other options, and changes in the perspectives from patients and employers of Group Health as a place to receive coverage and care.

Medicare Advantage represents the largest single payer at Group Health (10.5% in December 2011). In the integrated group practice, growth in Medicare Advantage mirrored growth in the group practice overall (10.1%) during the study. Enrollment in Medicaid and the Washington State's Basic Health program represented 4.3% of total enrollment in December 2011. Although growth in these programs was seen early in this study, enrollment in these programs fell in later years, in part because of funding constrictions and eligibility changes to the state's Basic Health program.

Staffing Expansions for the Group Health PCMH

To meet the expanding enrollment base and to meet the PCMH goals for smaller physician panels (1,800-2,000 patients), Group Health hired many new physicians and staff during this period.[1] In 2008, the median panel size (adjusted for case mix and full-time equivalency) was 2,228, with 54% of physicians being overpaneled (having $>2,000$ patients). By 2011, the median adjusted panel size had dropped to 1,858 with 19% of physicians overpaneled. Physician hiring and panel leveling was more difficult in some clinics than others. In particular, some clinics, particularly those outside the Seattle, Bellevue, and Spokane metropolitan areas, had more difficulty achieving and sustaining these staffing targets. Similarly, although recruiting other team members including registered nurses, licensed practical nurses, medical assistants, and clinical pharmacist was successful over the interval, some clinics had more difficulty than others.

Adding new physicians and other medical home team members added substantial new orientation and training demands. Not only did these new primary physicians require entry-level training on the Group Health system (eg, insurance products, coverage policies, pharmacies, specialty and hospital systems), its clinical practice guidelines, and formulary, and its systemwide EHR and other information systems, they also required training on the newly introduced PCMH processes and performance expectations (eg, expanded use of secure electronic messaging). Because hiring of new personnel was often not synchronized with the roll-out of the PCMH modules, training has remained a consistent challenge, particularly for some clinics.

Other Innovations at Group Health

As would be expected of a large complex health system, a variety of other initiatives were introduced concurrently to the PCMH, which may have influenced the outcomes observed. Our team has identified the 4 initiatives below as other important innovations occurring in primary care or in other parts of the Group Health system.

Opioid Prescribing Initiative – This initiative, developed and implemented in 2009-2010, focused on 7,000 patients who were receiving long-term opioid therapy at low, medium, and high dosage levels. The intervention involved designating 1 physician, generally a primary care physician, as responsible for the management of long-term opioid therapy, developing individualized care plans, setting expectations with patients for prescribing using a standardized treatment agreement, and conducting periodic monitoring visits and urine drug screening. This intervention has been described in detail elsewhere[5] and was implemented using Lean methods and techniques described above.

High-End Imaging Initiative – In response to rapid growth in the use of computed tomography and magnetic resonance imaging at Group health,[6] Group Health implemented a systemwide initiative in 2009-2010 to reduce unnecessary imaging and reduce unnecessary radiation exposure. Central to this initiative was the creation of decision support tools in the EHR that included questions on clinical reasons for these technologies to guide primary care and other physician ordering.
Emergency Department Hospital Inpatient (EDHI) Initiative – Beginning in the last quarter of 2009, Group Health implemented this systemwide initiative to reduce unnecessary hospital care by targeting patients once they reached the hospital. The EDHI project was implemented by Group Health's hospital teams (hospitalists and transition nurses) across its 7 main contracted hospitals. The initiative involved 2 key interventions: (1) avoiding unnecessary inpatients admissions by asking hospitalists to review all patients presenting to the ED and to facilitate appropriate ambulatory follow-up, and (2) avoiding readmissions by providing coordinated transition care to nursing homes, skilled nursing facilities, and home. In our analyses, we accounted for the EDHI initiative by conducting a sensitivity analysis on the hospital admission regressions to remove a possible cointervention effect by adjusting for monthly hospital ED-to-admission transition rates for the hospitals participating in this initiative.
24-Hour Urgent Care Expansion – In an effort to reduce ED visits to contracted and other hospitals, Group Health expanded the hours of one of its Seattle-based urgent care sites to 24 hours, 7 days a week from limited evening and weekend care. In our analyses, we accounted for this urgent care hours expansion by conducting a sensitivity analysis on the ED regression analyses by excluding the clinic populations that are account for most of the visits to this urgent care facility.

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Interpretative Summary

Contrary to how health care is organized for many Americans, Group Health is an integrated health care system in the Pacific Northwest that both provides health care insurance and delivers health care services to the populations it serves. In existence since 1946, Group Health provides health care insurance to about 10% of Washington State residents through a variety of insurance products including Medicare Advantage, Medicaid, commercial products, and individual or family plans. Most patients receive care through an integrated multispecialty group practice, but others are served by a network of community clinicians. For those receiving care in the group practice, primary care is delivered in 26 Group Health–owned and –operated facilities (1 closed during the study) that have on-site pharmacies, laboratories, and radiology suites. Primary care physicians employed in these facilities have historically been paid by salary rather than fee-for-service or capitation mechanisms. Group Health has a long history of "empaneling" patients to these physicians who work in teams composed of physician assistants, registered nurses, clinical pharmacists, licensed practical nurses, and medical assistants. The primary care teams are supported by a "medical neighborhood" that includes a 24-hour consulting nurse service, several case management programs (a complex case management program, a congestive heart failure program, and an anticoagulation management service), as well as by 10 specialty and behavioral health units, 6 urgent care centers, and 7 acute care hospitals (6 contracted and 1 maternity hospital). Group Health adopted a systemwide electronic health record in 2002, which features a robust Web portal that allows patients to schedule appointments, send secure messages to their clinicians, review portions of their record, complete health risk appraisals, and perform other tasks.

During the period of this study, there were several important contextual changes of which readers should be aware. First, there were substantial changes with regard to Group Health's enrolled population and the workforce who cared for them. Most importantly, between 2007 and 2011, Group Health witnessed a substantial growth (19%) of the enrolled patient population served by the patient-centered medical home (PCMH) clinics. Although growth occurred at all clinics (no new clinics were built), some clinics witnessed much larger growth than others. To match this growth and to meet the PCMH staffing targets, the number of employees also rapidly grew, including both physician and non-physician primary care staff. New employee "onboarding" created substantial and unanticipated challenges for training, team development, and patient paneling. Some clinics were more challenged than others with hiring, creating unevenness in the speed that empaneling targets were reached and sustained. Second, Group Health adopted the Lean Production System as its central method for quality improvement, change management, and reduction of waste beginning in 2007. Unlike other PCMH demonstration initiatives that rely on practice facilitation or coaching, Lean methods and tools were used to implement and standardize the medical home component interventions across Group Health's system. The Lean strategy emphasized use of front-line team members in process improvement and problem solving. It also emphasized the use of standardized daily management practices to improve quality and reduce waste. Third, in addition to the PCMH, the study period featured other care innovations and changes in Group Health's integrated system that may have influenced the study results. These innovations and changes included the implementation of initiatives on standardized opioid prescribing, high-end imaging, and hospital transitions, and an expansion of urgent care clinic hours.