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Nudging Guideline-Concordant Antibiotic Prescribing:

A Randomized Clinical Trial

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Abstract

IMPORTANCE—"Nudges" that influence decision making through subtle cognitive mechanisms have been shown to be highly effective in a wide range of applications, but there have been few experiments to improve clinical practice.

OBJECTIVE—To investigate the use of a behavioral "nudge" based on the principle of public commitment in encouraging the judicious use of antibiotics for acute respiratory infections (ARIs).

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Study concept and design: Meeker, Friedberg, Linder, Goldstein, Fox, Doctor.
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Study supervision: Meeker, Knight, Linder, Rothfeld, Doctor.
Intervention implementation: Knight, Doctor.
Drafted commitment letter content: Friedberg, Linder, Goldstein, Fox.
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DESIGN, SETTING, AND PARTICIPANTS—Randomized clinical trial in 5 outpatient primary care clinics. A total of 954 adults had ARI visits during the study timeframe: 449 patients were treated by clinicians randomized to the posted commitment letter (335 in the baseline period, 114 in the intervention period); 505 patients were treated by clinicians randomized to standard practice control (384 baseline, 121 intervention).

INTERVENTIONS—The intervention consisted of displaying poster-sized commitment letters in examination rooms for 12 weeks. These letters, featuring clinician photographs and signatures, stated their commitment to avoid inappropriate antibiotic prescribing for ARIs.

MAIN OUTCOMES AND MEASURES—Antibiotic prescribing rates for antibiotic-inappropriate ARI diagnoses in baseline and intervention periods, adjusted for patient age, sex, and insurance status.

RESULTS—Baseline rates were 43.5% and 42.8% for control and poster, respectively. During the intervention period, inappropriate prescribing rates increased to 52.7% for controls but decreased to 33.7% in the posted commitment letter condition. Controlling for baseline prescribing rates, we found that the posted commitment letter resulted in a 19.7 absolute percentage reduction in inappropriate antibiotic prescribing rate relative to control ($P = .02$). There was no evidence of diagnostic coding shift, and rates of appropriate antibiotic prescriptions did not diminish over time.

CONCLUSIONS AND RELEVANCE—Displaying poster-sized commitment letters in examination rooms decreased inappropriate antibiotic prescribing for ARIs. The effect of this simple, low-cost intervention is comparable in magnitude to costlier, more intensive quality-improvement efforts.

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Systems that depend on trusted professionals typicallyrely on rational models of human decision making. In health care, for example, we assume that the decisions of clinicians are based on scientific knowledge about best practices appropriately applied to each individual patient's needs; we refer to this as the *rational model* of clinician decision making. However, clinician decisions often diverge from the rational model of decision making, even when practice guidelines exist and are widely accepted. An alternative model suggests that clinician decisions are influenced by psychosocial factors such as perceived demand from patients, desire to conform to behavior of peers, concern over the opinion or approval of one's associates, and—importantly—the need to act in ways that are consistent with one's previous public commitments.[1–5] Some of these factors may contribute to overuse of medical care; others may be leveraged to reverse this tendency.

Despite published clinical guidelines for diagnosis[6] and treatment[7,8] of acute respiratory infections (ARIs) and decades of admonitions and clinical interventions, inappropriate antibiotic prescribing for ARIs persists.[9–11] Each year, adults in the United States receive 41.2 million antibiotic prescriptions for ARIs at a cost of $1.1 billion.[12] Half of these prescriptions are inappropriate, since they are prescribed to treat ARIs for which there is no evidence of benefit.[13] There are multiple reasons for this inappropriate antibiotic prescribing behavior, including "defensive prescribing," unawareness of diagnostic guidelines (eg, those