Knowing How to Stop: Ceasing Prescribing
When the Medicine Is No Longer Required

Remo Ostini, PhD; Desley Hegney, PhD; Claire Jackson, MD; and Susan E. Tett, PhD

Stopping prescriptions for medicines that patients no longer need is an important part of good prescribing practice. Yet, unlike the volumes of scientific evidence on starting medications, research to guide best practice prescribing cessation is rare. This would not be a concern if we could be confident that prescribing is routinely ceased when this is appropriate. There are reasons to believe that this is not the case. The concept of prescribing inertia provides a framework for understanding why prescribing might continue when it should not. Classic examples of short-term prescribing that should suffice include use of benzodiazepines, nonsteroidal anti-inflammatory drugs (NSAIDs, including cyclooxygenase [COX]-2 inhibitors), clopidogrel after stent insertion, and many instances of use of gastrointestinal medications such as proton pump inhibitors (PPIs). Pharmacoepidemiological evidence, growing problems with polypharmacy, and analyses of prescriber behavior also suggest that prescribing may often not stop when it should. There is little evidence to indicate whether prescribers perceive failure to cease prescribing to be a problem for prescribing practice. However, relevant indirect evidence suggests that the lack of research on how best to stop prescribing may be contributing to this problem.

Rationale for Cessation of Prescribing
Taking a medication is not always a benign activity. Patients should therefore not continue to receive medication prescriptions if the therapeutic rationale for taking the medication ceases to hold. A brief discussion paper by Alexander et al. (2006) on medication prioritization suggests that most medications do not require lifelong use. Rather, the ongoing benefit of a prescription should always be considered in its clinical and social context. Taking medicines in the absence of a clear therapeutic rationale can have unwanted consequences, which include unnecessary financial costs to patients and health systems; opportunity costs; an increased risk of polypharmacy, particularly in older patients; and an increased risk of adverse drug reactions. In contrast, discontinuing prescribing can simplify prescription regimens, reducing the likelihood of polypharmacy and the risks of adverse events and decreasing costs.

The idea of ceasing prescriptions is not new. A prescribing manual, developed 17 years ago by the World Health Organization to improve undergraduate medical student prescribing education, includes the option of stopping prescribing in the final (monitoring) step of a 6-step model of prescribing. The model, based on over 10 years of teaching pharmaco-therapy to medical students by the authors, has been reviewed by an international panel of pharmacotherapy educators and has been tested in medical schools in 7 countries. This model reminds us that the purpose of monitoring a prescription is to see whether it has been effective. While this monitoring includes guarding against side effects, it also means that an effective prescription for a nonchronic illness can and should be stopped.

Similarly, the pharmaceutical care model of pharmacy practice (now referred to as medication therapy management) includes “unnecessary drug therapy” as one type of drug problem that can be identified through appropriate monitoring. The stated resolution to this type of problem is to discontinue the medication.

How to Stop Prescribing
Recently, we conducted a systematic review of prescribing cessation research indexed by PubMed through November 2009 and EMBASE or International Pharmaceutical Abstracts through September 2008. We found only 12 relevant, high-quality, experimental or quasi-experimental studies among 1,306 articles that we reviewed. The review suggested that it is possible to stop a variety of medications through a range of interventions, including manual and electronic reminders, audit and feedback, distribution of educational materials, clinical pharmacist intervention, and regulatory intervention. However, the reviewed studies were highly heterogeneous in study design, patient characteristics, prescription settings, method of measuring prescribing, tests of intervention effects, and method of determining prescribing cessation. Often studies did not directly measure the occurrence of prescribing cessation and instead inferred cessation from changes in mean numbers of medications or dosages, prescribed daily doses or defined daily doses, and changes in drug-use patterns.

A key finding of our review into the limited prescribing cessation research to date is that both consumer (patient) and doctor buy-in is needed to successfully cease the prescribing of a medicine. This buy-in requires primary and secondary care prescribers to accept that stopping prescribing can be a good thing and to communicate this information to their patients. This approach is supported by research indicating...
that patient-mediated interventions are often successful in changing prescribing behavior generally, although we have previously found that the effects of these interventions can be inconsistent. Further work is needed to identify the features of patient-mediated interventions that make them effective.

Evidence that discontinuing prescribing need not worsen patient outcomes or cause adverse “withdrawal” effects is growing, as shown in the results of a systematic review by Iyer et al. (2008) of antihypertensive, benzodiazepine, and psychotropic agent withdrawal in patients aged 65 years or older. Iyer et al. reviewed research indicating that between 20% and 100% of patients could be withdrawn from their medications for periods of 4 to 52 weeks without clinically significant adverse events or withdrawal symptoms. It may be that many medications can be stopped safely. However, sudden and complete cessation will not always be the safest or most effective cessation method. Some drugs (e.g., benzodiazepines) may require tapering, others may need to be allowed to lapse (e.g., antibiotics, PPIs), while others may require alternatives yet to be identified (e.g., replacing multiple antihypertensives with a single agent). In cases where prescribers are unaware that unneeded prescribing is taking place or where they are unsure of how best to discontinue a prescription, prescribing cessation may require active intervention.

How to stop a specific medication will depend on various factors, including the prior duration of a medication’s prescription (e.g., long-term use of antilipid medications, such as statins, in the very old); whether other treatment therapies will be ongoing (e.g., was the ceased medication duplicating other medication being taken, or is a behavioral therapy such as psychotherapy or physiotherapy replacing a medication?); whether a ceased medication will be replaced by another medication; and how a medication interacts with other treatment therapies (e.g., stents and clopidogrel, balancing evidence for long-term as opposed to short-term use). Prescribing models that include a specific cessation step can help guide the design of prescribing cessation interventions.

Efforts to end prescribing are severely hampered by the lack of data about discontinuation of prescribing. Far more scientific research investigates starting medications than stopping them. In addition to drug-related factors associated with ending prescriptions, more information is needed about the social, interpersonal, and professional factors supporting ongoing prescribing that is not clinically indicated and about which of these factors may be effective intervention targets.

**Why Prescribing May Not Be Ceased**

Prescribing inertia has emerged as an important framework for understanding prescribing behavior when there is a failure to modify treatment despite the recognition of a problem with the current treatment. While more typically applied to the problem of failure to initiate or escalate treatment for chronic illnesses, the term “prescribing inertia” should apply equally to situations where prescribing has become routine and is continued despite lack of need. An overview of research into the treatment of often asymptomatic conditions such as hypertension, dyslipidemia, and diabetes shows that prescribers often fall victim to prescribing inertia and thus fail to prescribe according to treatment guidelines. We contend that this inertia is likely to include those relatively rare occasions where guidelines specify prescribing duration limits.

A number of specific barriers to prescribing discontinuation contribute to prescribing inertia. These include the following: (a) patient barriers, where discontinuation can seem like substandard care or capitulation; (b) professional barriers, such as when a specialist begins a prescription with unclear directions about length of use and a general practitioner does not cease that prescribing because of the unclear direction; a more general unwillingness to stop a prescription that another clinician has started, including prescriptions begun in hospitals; seeing discontinuation as threatening the clinician’s relationship with the patient; and the initiation of prescribing relying on data from randomized controlled trials, while evidence for discontinuation is often from observational or retrospective studies.

More generally, medication prescribing rarely occurs in a context that includes the initiative, system support, and/or multidisciplinary follow-up to track medication use on a continuing basis. While this issue is more commonly raised in adherence research, it is equally relevant to prescribing cessation.

**Evidence of Failure to Cease Prescribing**

The evidence for failure to stop prescribing is rarely direct. Anecdotal evidence that prescribing often does not stop when it should is supported by 3 types of information: (a) analyses of physician prescribing behavior; (b) pharmacoepidemiological studies of specific drugs that show prescribing occurring well beyond expected durations and above levels indicated by therapeutic guidelines and illness prevalence; and (c) data indicating increasing levels of polypharmacy.

**Analyses of Physician Prescribing Behavior**

Prescriptions serve an important psychological role in acknowledging patients’ suffering and validating a decision to seek medical attention. Prescribing is also driven by the propensity of doctors to be more concerned about failing to treat a treatable condition than they are about the adverse consequences of overprescribing—at least in part because the adverse consequences are likely to be remote in time.

Social norms guide expectations for doctor-patient interaction and streamline the process of a doctor arriving at a prescribing conclusion. Norms are learned practices that grow as precedents accumulate, are enforced by the teaching structure of medicine, and ultimately become labeled as “standard care.”
An analysis of the influence of social norms on antibiotic overprescribing by the McDonnell Norms Group (2008) suggested that norms can trump evidence, especially in the face of incomplete knowledge of optimal care and when prescribing behavior is driven by anecdotal experience. This phenomenon is related to physicians expressing a strong need to remain in control of the prescribing process. These social norms often invoke active learning processes, such as turning to other physicians for help in deciding how to prescribe, as well as a need for personal experience of drug effects in patients (clinical experience in lieu of evidence). Once learned, these decisions become part of a routine, leading physicians to develop a high degree of habit persistence or prescribing inertia in their prescriptions. This behavior is driven by anecdotal experience. This phenomenon is often invoked by active learning processes, such as turning to other physicians for help in deciding how to prescribe, as well as a need for personal experience of drug effects in patients (clinical experience in lieu of evidence). Once learned, these decisions become part of a routine, leading physicians to develop a high degree of habit persistence or prescribing inertia in their prescriptions for patients and producing a vulnerability to the status quo.

Evidence of a prescriber’s vulnerability to the status quo can be found in research demonstrating persistently high levels of repeat prescribing. This prescribing inertia can also be seen in the influence of hospital- and specialist-initiated prescriptions on primary care prescribing practice.

**Pharmacoepidemiological Evidence.** Clopidogrel is an example of a medication that should be ceased after a specified time but may not be. A patient reminder card was introduced in the United Kingdom to encourage continuation of clopidogrel for the recommended length of treatment. The card (available from the UK Clinical Pharmacy Association) describes the indication for clopidogrel use and the planned duration of treatment. Such patient information aids that include when a therapy may be ceased are rare. In a pharmacoepidemiological study in Australia, we found that clopidogrel prescribing for military veterans through the national reimbursement formulary occurred for longer than the 4 months indicated in the Australian Pharmaceutical Benefits Scheme in at least one-third of beneficiaries. Results across all reimbursement groups nationally indicated a 7-fold increase over 8 years— from 1.2 to 9.0 defined daily doses per 1,000 population per day. Such a dramatic increase was considered unlikely to reflect an increase in the prevalence of the indications for which clopidogrel was subsidized on the formulary.

Similarly, benzodiazepine prescription beyond clinical indication is a recurring problem to the extent that this is the only class of drugs that is the subject of repeated ongoing research efforts to find effective cessation interventions. PPIs, NSAIDs, and opioid analgesics have also been suggested as drugs for which prescribing often continues long beyond their therapeutic duration. The precise extent of the problem of failure to appropriately cease ongoing prescribing is, however, simply unknown as it has not been systematically investigated.

**Polypharmacy Evidence.** As people age, they can accumulate medicines. However, while polypharmacy is often associated with prescribing in the elderly, it also occurs in children and adolescents, particularly in the context of psychotropic medication prescribing. Polypharmacy can lead to specific problems, such as serotonin syndrome, which results from the unnecessary prescribing of multiple antipsychotic medications. It can also lead to unnecessary safety and health risks, especially in the elderly, including increased risks of adverse drug reactions, falls, hip fracture, poor nutrition, and hospitalization and mortality.

Potentially inappropriate prescribing in the elderly (PIPE) is an area of medication prescribing research that has grown, in part as a response to the problems caused by polypharmacy in the elderly. It has been studied at the health systems level, among patients in Medicare managed care, and in ambulatory and community-dwelling patients. A prescriber education intervention was associated with a reduction in PIPE from 5.3% to 4.3% of prescriptions over 2 years, while a computerized pharmacist alert resulted in inappropriate medications dispensed to fewer intervention patients (1.8%) compared with usual care patients (2.2%). Medication review interventions have also been associated with reductions in inappropriate prescribing, including the report by Hanlon et al. (1996) in a group of older adults with polypharmacy, in which inappropriate prescribing was reduced by 24% compared with 6% in a control group. Monane et al. (1998) found that a computerized drug utilization review alert system combined with telephone calls to a subset of physicians was associated with change to a more appropriate medication in 24% of the cases, but the rate of change ranged from 40% for long half-life benzodiazepines to 2%-7% of drugs that may have been contraindicated based on patients’ self-reported drug history. PIPE research aims to improve medication prescribing; however, only infrequently, as in the Medicare managed care research cited earlier, does it address the role of prescribing cessation in improving therapy.

A review of pediatric psychotropic polypharmacy rates across a range of settings in the United States, in which polypharmacy was defined as the concomitant use of 2 or more psychotropic medications for 1 or more psychiatric conditions, found rates ranging from 0.7%-42%—with the higher number being for inpatients (n = 59). When polypharmacy is defined as the concomitant taking of 9 or more medications, prevalence estimates range from 15.5% of long-term care residents in Ontario, Canada (2005), to 40% of nursing home residents in a national survey in the United States in 2004. While polypharmacy is not inherently an indication that unneeded medications are being prescribed, some of the higher rates of polypharmacy are likely to include instances of medication prescribing that can be ceased. As with other forms of evidence for failure to cease prescribing, data on its precise role in polypharmacy are not available.

**Conclusions**

Ending prescriptions that do not confer a therapeutic benefit...
outweighing the costs of such treatment (to health as well as financial) is an important component of good prescribing practice. For discontinuation to be successful, good data on how to stop prescriptions are required. Those data are currently unavailable in many cases. The need for data on how to stop prescribing is premised on the perception that prescribing does not currently always stop when it should. That perception is often based on indirect evidence. Research that explicitly tests that perception would also be valuable. Failure to conduct the research necessary to understand prescribing cessation means that people will likely continue to take medications that they do not need, incurring the associated risks to patient safety—including morbidity and mortality—and the related social and economic costs.

DISCLOSURES

The authors reported no funding for this manuscript and no financial or other potential conflicts of interest related to the subject matter of this manuscript.

Concept and design, data collection, and data interpretation were performed by all 4 authors. The manuscript was written and revised primarily by Ostini with the assistance of Tett.

REFERENCES


Knowing How to Stop: Ceasing Prescribing When the Medicine Is No Longer Required


