ment total affected my 2013 salary negotiations. I will not be able to provide insights as to why the Medicare payment I received might differ (either positively or negatively) from that allocated to another general cardiologist who provided comparable services in equal numbers at another academic medical center — nor would I choose to refer my patients for a second or third opinion on the basis of such information.

Processes for the use of these data for research and policymaking would clearly be strengthened by efforts to ensure their validity and to account for patients' disease complexity and risk level. Insights gleaned from linking these data to quality measures and health outcomes would inform conversations regarding the value proposition to which we all aspire. One critical next step will be the proactive engagement of informed patients in discussions about their care, including its cost when appropriate.

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1. Historic release of data gives consumers unprecedented transparency on the medical services physicians provide and how much they are paid. Press release of the Department of Health and Human Services, April 9, 2014 (http://www.hhs.gov/news/press/2014pres/04/20140409a.html).

2. Medicare provider utilization and payment data: physician and other supplier. Baltimore: Centers for Medicare & Medicaid Services (http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Physician-and-Other-Supplier.html).

3. United States District Court, Middle District of Florida, Jacksonville Division. Case 3:78-cv-00178-MMH-MCR Document 73 filed 05/31/13.

4. Medicare fee-for-service provider utilization & payment data — physician and other supplier public use file: a methodological overview. Baltimore: Centers for Medicare & Medicaid Services, 2014 (http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Downloads/Medicare-Physician-and-Other-Supplier-PUF-Methodology.pdf).

5. Abelson R, Cohen S. Sliver of Medicare doctors get big share of payouts. New York Times. April 9, 2014 (http://nyti.ms/1kptFzK).

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Clinicians' Involvement in Capital Punishment — Constitutional Implications

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If capital punishment is constitutional, as it has long been held to be, then it "necessarily follows that there must be a means of carrying it out."[1] So the Supreme Court concluded in *Baze v. Rees*, a 2008 challenge to Kentucky's lethal-injection protocol, in which the Court held that the means used by Kentucky did not violate the Eighth Amendment's prohibition against cruel and unusual punishment. Lethal-injection procedures have changed significantly since 2008, and that fact coupled with Oklahoma's recent botched lethal injection of Clayton Lockett, the latest in a long series of gruesome and error-ridden executions, has raised questions about whether current methods would pass constitutional muster if reviewed by the Supreme Court. Unfortunately, they probably would.

This likelihood may surprise members of the medical and scientific communities who oppose involvement by their professions in implementing the death penalty. Lethal injection, the primary execution method used in all death-penalty states, was adopted precisely because its sanitized, quasi-clinical procedures were intended to ensure humane deaths consistent with the Eighth Amendment. But experiences like Clayton Lockett's, which result from prisons' experimentation with untested drugs and reliance on personnel with unverifiable expertise, demonstrate the dearth of safeguards for ensuring that this goal is actually achieved. Some drug companies now refuse to distribute drugs used for executions, pharmacies are reluctant to participate unless their identities are shielded, and organized medicine has taken a stand against physicians' involvement in capital punishment. Nevertheless, states have demonstrated their willingness to continue with lethal injections, and most federal courts have allowed executions to proceed in the face of constitutional challenges. The time is therefore ripe for the medical and scientific communities to consider, once again, their role in this process.

The precedent set by the Court in *Baze v. Rees* establishes that, in order for an Eighth Amendment challenge to succeed, a petitioner must demonstrate that an execution procedure imposes a "substantial" or "objectively intolera-

ble" risk of serious harm and that there is a "feasible, readily implemented" alternative that "in fact significantly reduce[s] a substantial risk of severe pain."[1] If clinicians' and scientists' ethical obligation to avoid involvement in executions makes it impossible for a condemned prisoner to identify such an alternative, then current lethal-injection procedures, however flawed, will probably be upheld as constitutional.

Many commentators have argued that the recent substantial changes made to state lethal-injection protocols would not satisfy this constitutional standard. The Kentucky policy challenged in *Baze* was the standard three-drug protocol developed in 1976 by Oklahoma's state medical examiner and later adopted in all states — a combination of sodium thiopental, pancuronium bromide, and potassium chloride. But states have since modified their execution procedures with unprecedented frequency.[2] Some have replaced sodium thiopental with pentobarbital; Florida instead uses midazolam hydrochloride. Others have adopted two-drug or single-drug protocols involving drugs such as pentobarbital, midazolam, hydromorphone, and propofol; some drugs are sourced from compounding pharmacies, and others have unknown sources.[3] Though a court might conclude that an untested protocol poses a substantial risk of harm, it's very unlikely that a prisoner could satisfy the second step of the *Baze* test — identifying a feasible, implementable, and less painful alternative.

One proposed alternative would be to require active participation and oversight by clinicians. The petitioner in *Baze*, for example, argued that the presence of a licensed anesthesiologist during lethal injection would help ensure the procedure's constitutionality. Although most states currently permit physician involvement in executions, the few that require it typically do not impose on attending physicians any responsibilities beyond declaring or certifying death. Rather, state laws grant correctional-facility directors great discretion in selecting execution-team personnel with appropriate qualifications and training (though state secrecy laws shield their identities and qualifications from public scrutiny). Both the plurality and concurring opinions in *Baze*, however, seemingly dismissed the argument that physician involvement is constitutionally required. The plurality noted that requiring an anesthesiologist "is nothing more than an argument against the entire procedure," given ethical prohibitions against medical involvement; Justice Samuel Alito's concurrence concluded for the same reason that modifying lethal-injection procedures to include medical personnel would not be feasible. The Death Penalty Committee of the Constitution Project (a think tank focused on constitutional and legal issues) also recognized this problem in a May 2014 report, yet it strongly recommended medical-professional involvement in executions while acknowledging that its recommendation might effectively render capital punishment infeasible.[3] Such a result, according to the Supreme Court, would be unacceptable.

A second proposal for improving the lethal-injection process calls on medical or scientific researchers to develop a protocol that is simple to administer and substantially less likely to cause pain — for example, the one-drug protocol used in veterinary euthanasia. The Constitution Project, for example, recommended that states develop new protocols based on "the latest scientific knowledge," with "meaningful input from recognized and legitimate scientific experts."[3] Indeed, governments practicing capital punishment have long relied on the medical profession for guidance — the guillotine, electrocution, lethal gas, and lethal injection were all developed by or adopted at the suggestion of medical professionals. But the ethical principle of nonmaleficence that prohibits medical professionals' participation in the execution procedure itself — codified in Opinion 2.06 of the American Medical Association's code of ethics — also prevents providers from advising states about how to conduct the process. Although nonclinical researchers, such as toxicologists, who may not be bound by the same ethical prohibitions, might be called on to provide guidance, the 21st-century scientific community has thus far been unwilling to do so. Moreover, legal restrictions on human-subjects research in the federal Common Rule would prohibit testing of new execution procedures on prisoners with the goal of establishing a new protocol. Since the Supreme Court in *Baze* rejected the one-drug proposal offered by the petitioner because it was "untested" and no scientific studies had demonstrated its comparative effectiveness, the proposal to modify execution protocols on the basis of scientific recommendations does not seem feasible either.

Thus, prisoners and death-penalty opponents are in a bind: lethal injection will continue until they establish scientific support for a safer and implementable procedure. Clinicians, researchers, and drug manufacturers are similarly bound: although their refusal to participate may temporarily halt some executions, it won't change the status quo from a constitutional perspective.

The clinical community, however, should not be faulted for this state of affairs. Rather, the fault lies in state legislators' decisions to adopt a medicalized form of execution without obtaining the support of professionals whose expertise was arguably essential for its humane implementation. Now that the practice of lethal injection is well established, it will be upheld as constitutional unless the clinical community gives its stamp of approval to a safer and more effective process.

An audio interview with Dr. Sawicki is available at NEJM.org

Although continued opposition by the medical profession is constitutionally immaterial, it may be effective if used as a means of advocacy for policy change. Perhaps voters, reacting to executions during which prisoners shout out and writhe in pain, will democratically decide that capital punishment is inherently inhumane. But if abolishing capital punishment requires public awareness of the harms inflicted during botched executions, then these harms (which have been occurring for decades without prompting nationwide policy change) must continue — a troubling prospect.

Moreover, even if these experiences inspire policy changes, it's unclear what form those changes will take. Perhaps states will revert to execution methods that don't require medical expertise, such as electrocution, as Tennessee recently announced it would. Perhaps states will take advantage of courts' liberal policies on executions' secrecy[4,5] and further reduce transparency and public accountability. Perhaps, if states decide to continue with lethal injection even without clinicians' involvement, the claim that medical ethics permits compassionate assistance to reduce prisoners' suffering may carry greater weight. In the meantime, uncertainty regarding voters' and politicians' likely reactions to botched executions increases the importance of continued discussion about professional ethics and role conflicts within the medical and scientific communities.

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1. Baze v. Rees, 553 U.S. 35 (2008).
2. Denno DW. Lethal injection chaos post-*Baze*. Georgetown Law Journal (in press) (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2328407).
3. Constitution Project Death Penalty Committee. Irreversible error: recommended reforms for preventing and correcting errors in the administration of capital punishment. 2014 (http://www.constitutionproject.org/wp-content/uploads/2014/05/Irreversible-Errors_FINAL.pdf).
4. In re Lombardi, 741 F.3d 888 (8th Cir. 2014), cert. denied, 134 S. Ct. 1790 (U.S. 2014) and reh'g denied, 741 F.3d 903 (8th Cir. 2014).
5. Sepulvado v. Jindal, 729 F.3d 413, 419 (5th Cir. 2013), cert. denied, 134 S. Ct. 1789 (U.S. 2014).

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