independently associated with a physician’s lack of awareness of incentives payments.

Analyses were performed using Stata statistical software (version 12.0; StataCorp).

Results | In 2007 to 2008, 2545 eligible physicians completed the NAMCS induction survey. The proportion of physicians who received some compensation for quality was 21.5% (95% CI, 18.9%-24.0%) and the proportion for patient satisfaction was 18.7% (95% CI, 16.3%-21.1%). An almost similar percentage of physicians did not know whether they received compensation for quality (16.2% [95% CI, 13.1%-19.2%]) or patient satisfaction (16.0% [95% CI, 13.0%-19.0%]). Physicians who did not know whether their compensation was linked to quality were more likely to practice in an urban setting (adjusted odds ratio [AOR], 2.50 [95% CI, 1.36-4.56]), more likely to practice in a freestanding clinic or urgicenter (AOR, 2.01 [95% CI, 1.07-3.78]), and less likely to practice in a community health center (AOR, 0.16 [95% CI, 0.06-0.42]) vs private practice. Physicians who did not know whether their compensation was linked to patient satisfaction were also more likely to practice in an urban setting (AOR, 2.24 [95% CI, 1.30-3.85]) and less likely to practice in a community health center (AOR, 0.17 [95% CI, 0.07-0.42]) vs private practice (Table).

Discussion | In a national survey of physicians, 1 in 6 did not know whether pay-for-performance was incorporated into their compensation. These findings support previous reports from smaller samples showing a lack of awareness about pay-for-performance initiatives. These findings suggest an important mechanism underlying the relative ineffectiveness of financial incentives in changing physician behavior and improving quality of care: physicians may be unaware of these incentives. If payers want pay-for-performance programs to be more effective, they may need to ensure that physicians understand what the incentives are and how they might affect their compensation.

The years of the NAMCS survey used for this study were soon after the implementation of the Physician Quality Reporting System, a program by the Centers for Medicare and Medicaid Services that provides financial incentives for reporting quality measures. Given this proximity, it is unclear whether our findings reflect physician awareness after this program was implemented. Future research should aim to understand what the incentives are and how they might affect their compensation.

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Critical revision of the manuscript for important intellectual content: Bishop.

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Administrative, technical, and material support: Bishop.

Study supervision: Bishop.

Conflicts of Interest Disclosures: None reported.

Funding/Support: Dr Bishop is supported by a National Institute on Aging Career Development Award (K23AG043499) and as a Nanette Laitman Clinical Scholar in Public Health at Weill Cornell Medical College.

Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.


HEALTH CARE REFORM

Potential Savings by Reduced CD4 Monitoring in Stable Patients With HIV Receiving Antiretroviral Therapy

The appropriate monitoring of chronic disease conditions offers high-yield opportunities to improve the value of medical care by reducing excess testing. For people living with human immunodeficiency virus (HIV)/AIDS in the United States who are virologically suppressed while receiving antiretroviral treatment (ART), HIV has become a chronic condition.

The 2013 Department of Health and Human Services Guidelines for Adult and Adolescent HIV Care recommend CD4 monitoring every 6 to 12 months “in clinically stable patients with suppressed viral load [no detectable HIV RNA in blood],” although some clinicians perform this test quarterly. Recently published data show that CD4 results in such patients rarely (if ever) influence management. We sought to estimate how reduced CD4 testing frequency in virologically suppressed patients could contribute to savings at the US population level.

Methods | The Centers for Disease Control and Prevention estimates that 28% (336 000) of the 1.2 million people living with HIV/AIDS in the United States are virologically suppressed while receiving ART. Of these, cohort data suggest that 80% (270 000) meet criteria for sustained suppression while receiving stable ART. Human immunodeficiency virus-associated life expectancies in the United States and Europe are estimated at 22 to 34 years after HIV diagnosis. The CD4 test costs range from $38 to $67 per test, depending on whether CD4% is included. Using these estimates, we examined na-
tion costs associated with strategies of CD4 monitoring in this selected population.

Results | We project that the current strategy of biannual CD4 monitoring costs $20.5 million per year at the conservative cost of $38 per test; reducing CD4 monitoring to once per year could result in annual savings of $10.2 million (Table). Many clinicians routinely use the more expensive CD4% (frequently including quantitative CD8 count, at $67 per test), in which case annual savings could reach $18.1 million. Decreasing CD4 frequency could result in a population savings of $22.5 to $615.1 million over the lifetime of patients in care, depending on life expectancy and CD4 test cost. In clinical practices in which routine CD4 monitoring is obtained every 3 months, savings associated with annual CD4 monitoring would be 3-fold higher.

Discussion | Reduced frequency of routine CD4 monitoring improves the value of care for all stable, virologically suppressed patients with HIV. Given the emphasis on “redirected” financing to improve health care spending, the potential $18 million savings annually might allow for more efficient use of these HIV care dollars. Even greater savings would occur if CD4 monitoring in stable patients were eliminated entirely, which warrants consideration.

The most important question regarding CD4 monitoring is whether reducing its frequency will adversely affect health outcomes by delaying clinical decisions, including initiation of opportunistic infection (OI) prophylaxis or ART modifications. Rarely do virologically suppressed patients with current CD4 counts of at least 300/μL experience acute OIs or CD4 decline to less than 200/μL, the threshold for Pneumocystis jirovecii pneumonia prophylaxis. Furthermore, clinicians use HIV RNA as the most sensitive method to monitor for treatment failure, typically owing to poor adherence or resistance. CD4 testing would still be indicated for patients who are no longer virologically suppressed.

Our results likely underestimate the potential savings from reduced frequency of routine CD4 monitoring. Variability in CD4 test results is common owing to diurnal variation, medications, infections, and laboratory variability. Unexpected decreases in CD4 counts are confirmed by repeated tests, the costs of which are not included in our estimates. Even a single low CD4 value requires extra reassurance to patients regarding its limited importance given ongoing viral suppression.

The number of virologically suppressed patients with HIV is growing; as the population eligible for a reduced frequency of CD4 monitoring is increasing, so are the opportunities for savings. Given the still unmet medical needs of people living with HIV/AIDS, a recommendation for at most annual CD4 monitoring in stable, virologically suppressed patients offers a high value opportunity for a wise reinvestment of care.

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Conflict of Interest Disclosures: None reported.

Funding/Support: This work was supported by the National Institutes of Allergy and Infectious Disease (grants R37 AI44206 and T32 AI007433).

Role of the Sponsor: The funding source had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Contributions: We thank the Cost Effectiveness of Preventing AIDS Complications (CEPAC) research group. 

Table. Projected Costs With Different Strategies of CD4 Monitoring in Routine Care for the Estimated 270 000 HIV-Infected Patients Receiving Suppressive ART in the United States

<table>
<thead>
<tr>
<th>Frequency, mo</th>
<th>Annual Costs*</th>
<th>Projected for LE of 22 Years</th>
<th>Projected for LE of 34 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CD4 Test Cost</td>
<td>CD4 Test Cost</td>
<td>CD4 Test Cost</td>
</tr>
<tr>
<td>Every 3</td>
<td>$38</td>
<td>$1591.9</td>
<td>$2460.2</td>
</tr>
<tr>
<td>Every 6th</td>
<td>20.5</td>
<td>796.0</td>
<td>1230.1</td>
</tr>
<tr>
<td>Every 12</td>
<td>10.3</td>
<td>398.0</td>
<td>615.1</td>
</tr>
</tbody>
</table>

Abbreviations: ART, antiretroviral therapy; HIV, human immunodeficiency virus; LE, life expectancy.

* All costs in US $ (millions).

* Assumed current standard of care.


Editor’s Note

Directing Resources to Where They Are the Most Needed

Old habits die hard. Since the 1980s, when we first came to understand that CD4 cell depletion is one of the hallmarks of immune deficiency in persons with AIDS, we clinicians have checked the CD4 counts of our stable patients every 3 months (more often for those who were sick or starting new therapy). Our patients (and we) worried from visit to visit whether their CD4 counts (we called them T-cells then) rose or dropped (mostly they dropped), and our spirits rose and fell with their counts.

That was then. Today we have highly effective antiretroviral treatment for human immunodeficiency virus (HIV) and a much better marker of how our patients are doing: the HIV viral load. Patients with undetectable virus in their blood are likely to do well as long as they keep taking their medication. The first sign of trouble is an elevated viral load. If perchance a patient of mine had a major drop in the CD4 count despite having an undetectable viral load, my first thought would be that the CD4 count was in error.

So, if CD4 counts are no longer driving treatment decisions in stable patients who are virally suppressed while receiving antiretroviral treatment, why do we still order these tests? Because it is our habit, and our patients expect it. Although ordering the test likely causes little harm to our patients (unnecessary anxiety if there is a false-negative drop in the count), the tests are expensive. As demonstrated by Hyle et al, if we would order them at most yearly for our stable virally suppressed patients (instead of every 6 months), we would save $10 million a year in the United States. We could use that money in ways that would likely have a much greater impact on the population of HIV-infected persons, including early HIV detection and linkage to medical care, medication adherence counseling (so that CD4 counts do not drop owing to missed doses), substance abuse treatment, and supportive housing.

Resources are finite. We should always seek to spend them in ways that bring the greatest good. Eliminating unnecessary CD4 counts and providing treatment with more impact is a good way to start.

Mitchell H. Katz, MD

Disclaimer: The views expressed herein are those of the author and not necessarily the views of the County of Los Angeles, California.

Trends in the Earnings of Male and Female Health Care Professionals in the United States, 1987 to 2010

Nearly 40 years after the adoption of the Title IX Amendments of the US Civil Rights Act, women account for almost 50% of US medical students and more than one-third of all physicians. Historically, female physicians have earned considerably less than male physicians, though in the 1990s much of this was attributable to gender differences in specialty choice and hours worked. However, more recent data suggest that female physicians currently earn less than male physicians even after adjustment for specialty, practice type, and hours worked. \(^5\) Salary differences between men and women currently exist among physician researchers as well. \(^3\) This raises questions about whether the gender gap in earnings among US physicians has closed over time, particularly compared with the earnings gap for other health care professionals and workers overall. Comparing earnings of male and female physicians over time is important in assessing the impact of policies to promote gender equality among physicians.

Methods | Using nationally representative data from the March Current Population Survey (CPS) from 1987 to 2010, we estimated trends in the male-female earnings gap among physicians, other health care workers, and workers overall. The CPS has been used to study trends in physician work hours and earnings. \(^4,5\) The CPS data are collected monthly and are based on personal and telephone interviews of approximately 60,000 households. The data are deidentified and made publicly available, and thus this study was exempt from institutional board review.

We used self-reported data from the CPS on occupation, hours worked, annual earnings, age, sex, and race. Response rates exceeded 90% across years. \(^5\) Physicians were identified based on a self-reported occupation of physician or surgeon. Other health care professionals were identified based on a self-reported occupation of dentist, pharmacist, nurse, physician assistant, or health care and insurance executive. Because the values of earnings reported were capped by the US census to protect identities (eg, the cap was $250,000 in 2010), we analyzed trends in median annual earnings. We analyzed 3 periods (1987-1990, 1996-2000, and 2006-2010) to smooth annual fluctuations in the data. We excluded individuals younger than 35 years to focus on physicians completing residency. \(^6\) The CPS does not collect data on physician specialty. Additional limitations of the CPS for studying physician earnings have been noted elsewhere. \(^5\)

We used median regression analysis to study trends in earnings across occupations, adjusting for age, sex, race, hours worked, and state. We adjusted for hours worked to avoid overstating gender differences in earnings if female physicians work fewer hours. For each occupation, we estimated a pooled regression model of both women and men, with interaction terms between sex and year to estimate sex-specific trends. We predicted earnings holding covariates other than sex and year fixed at their mean values. Dollar values were normalized to 2010 dollars.