

cases and . . . timing of the lumbar puncture.” We stated that “in six of seven patients with sporadic Creutzfeldt-Jakob disease in whom the RT-QuIC test of cerebrospinal fluid was negative but the RT-QuIC test of olfactory mucosa was positive, the lumbar puncture and olfactory mucosa brushing were performed at almost the same interval after disease onset, suggesting that the observed differences in prion seeding activity between these specimens were not due to differences in sampling time.” We stand by this conclusion, although we now realize that the stated numbers pertain to total, rather than sporadic, Creutzfeldt-Jakob disease cases. Other, larger RT-QuIC analyses of cerebrospinal fluid specimens yielded sensitivities of 83 to 89%,^{1,2} as compared with our provisional sensitivity of at least 97% from olfactory mucosa. Much further study is required, but since our initial report, we have collected these two specimen types simulta-

neously from 12 additional patients, with a sensitivity of 100% from olfactory mucosa (12 of 12 samples) and 83% from cerebrospinal fluid (10 of 12 samples).

Gianluigi Zanusso, M.D., Ph.D.

Matilde Bongianni, Ph.D.

University of Verona
Verona, Italy

Byron Caughey, Ph.D.

Rocky Mountain Laboratories
Hamilton, MT
bcaughey@nih.gov

Since publication of their article, the authors report no further potential conflict of interest.

1. McGuire LI, Peden AH, Orrú CD, et al. Real time quaking-induced conversion analysis of cerebrospinal fluid in sporadic Creutzfeldt-Jakob disease. *Ann Neurol* 2012;72:278-85.
2. Atarashi R, Satoh K, Sano K, et al. Ultrasensitive human prion detection in cerebrospinal fluid by real-time quaking-induced conversion. *Nat Med* 2011;17:175-8.

DOI: 10.1056/NEJMc1410732

Effect of Hospital Pay for Performance on Mortality in England

TO THE EDITOR: Sufficient money can almost certainly change clinicians' behavior. What we need to find out is what types of behavior are likely to change (and how much) and whether pay for performance is cost-effective. Kristensen et al. (Aug. 7 issue)¹ conclude that results from “a pay-for-performance program in England were not maintained.” Eijkenaar² and So and Wright³ found that improvements associated with pay for performance in health care are inconsistent and often small. In searching for an explanation, Kristensen et al. do not entertain the possibility that pay for performance in health care is ineffective. Research outside of medicine has shown that pay for performance for cognitively based tasks leads to worse performance.⁴ It is ironic that clinicians, people who have chosen one of the most altruistic and cognitive of professions, must be induced by payment to do the right thing. An alternative approach is performance monitoring — paying clinicians and hospitals to report outcomes, but not tying payment to the

outcomes. Although some observers may suspect this strategy, we need to look no further than clinical trainees, who work tirelessly on behalf of patients and receive a salary but no pay related to patients' outcomes.

James G. Wright, M.D., M.P.H.

Hospital for Sick Children
Toronto, ON, Canada
james.wright@sickkids.ca

No potential conflict of interest relevant to this letter was reported.

1. Kristensen SR, Meacock R, Turner AJ, et al. Long-term effect of hospital pay for performance on mortality in England. *N Engl J Med* 2014;371:540-8.
2. Eijkenaar F. Pay for performance in health care: an international overview of initiatives. *Med Care Res Rev* 2012;69:251-76.
3. So JP, Wright JG. The use of three strategies to improve quality of care at a national level. *Clin Orthop Relat Res* 2012;470:1006-16.
4. Ariely D, Gneezy U, Loewenstein G, Mazar N. Large stakes and big mistakes. *Rev Econ Stud* 2009;76:451-69.

DOI: 10.1056/NEJMc1410670