can be spread through the blood supply. I am not aware of any published data to support this assertion. Experts generally agree that there is only a *theoretical* risk of transmission of either CJD or vCJD through the transfusion or injection of blood components or fractionated plasma products. For example, the Irish Department of Health (and more recently the Belgian Health Ministry) decided to notify and provide counselling to recipients of a radiological dye manufactured from a plasma pool that included a United Kingdom blood donor who died of vCJD.[1] A spokesman for the Irish Department of Health has been quoted as saying there was no evidence CJD could be transmitted by blood or blood products, but the injectable dye was withdrawn as "a precautionary measure."

If there is scientific evidence to support Hoey's statement, I would be most interested in finding out where to obtain the data. However, if the statement is incorrect, please consider publishing a correction.

Bryce Larke, MD
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[The author responds:]

I disagree with the statement that "there is absolutely no evidence that vCJD can be spread through the blood supply." However, I accept Dr. Giulivi's questioning of my statement that "vCJD can be spread through the blood supply." Both are pronunciamentos and have little (or even negative) value. If Giulivi means that there are no reported cases of CJD or vCJD that have been transmitted through the blood supply, then he is right. But this lack of evidence does not mean that such transmission is not occurring. Giulivi is making an all-too-common error, since "the absence of evidence is not evidence of absence."[1]

Science is more than epidemiology. "Biology is complex, messy and richly various, like real life."[2] So what do we know about CJD and vCJD? Spongiform encephalopathies occur in a wide variety of animals. They differ in their histologic features, clinical manifestations (including incubation periods), species preferences and abilities to cross species boundaries and in terms of the inoculum required to cause disease and virulence generally.[3–5]

First described in the 1920s, CJD is rare (1 to 2 cases per million). But because plasma pools may contain units from about 60 000 donors, it is likely that if the disease could be transmitted through the blood supply, it would have been evident by now (unless the doses of infective agent are low and the incubation periods very long). So it is unlikely that CJD is transmitted through the blood supply. (If this is so, then it would be interesting to know why the Canadian Red Cross is withdrawing blood products donated by people with CJD.)

But vCJD is not CJD. We know little about vCJD. It appears to easily cross species borders (e.g., from cattle to humans) and seems to affect primarily younger people.

Worst-case estimates of the number of people in the UK infected with vCJD range up to 80 000 or about 1 in every 700 blood donors.[6] So it is really important to know if vCJD can be spread through the blood supply. Because there is no screening test for

vCJD in humans (or animals), our evidence has to come from animal experiments. Waiting for human epidemiologic evidence would be a mistake.

Studies presented at scientific meetings and shortly to be published have shown that in hamsters and mice (species that have a rodent form of scrapie), the infective agent of scrapie is present in blood and can be transmitted from one animal to another within a single species (Dr. Robert Rohwer, Veterans Affairs Medical Center, Baltimore: personal communication, 1998). Also, as Giulivi notes, B cells have a receptor for normal prions — and presumably also for abnormal prions. Here is a possible biological mechanism that would allow prions attached to leukocytes to cross the blood–brain barrier.

So, can vCJD be transmitted through the blood supply? The jury is out, and the regulators and public health officials have a tough job. The point of my editorial was to underline the complexity of these decisions and to support the development of ethical guidelines for regulators. Understanding how these decisions are made and providing ethical support for the people making them is more important than a plethora of pronunciamentos.

I do not believe that my editorials will "set up a chain reaction among physicians, [causing them to] worry and arrive at the wrong conclusions." Our readers are a sceptical lot. Most would agree, I think, that there can be no conclusions in science. But there should be action, and physicians must always give advice to patients that is based on their knowledge of basic science and clinical medicine — not just epidemiology.

John Hoey, MD
Editor-in-Chief
CMAJ

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[Dr. Robert Rohwer comments, at the invitation of the editor-in-chief:]

Although I am unaware of any direct evidence that new variant CJD "can be spread through the blood supply," there is nevertheless increasing concern over our complete lack of knowledge on this point. It is now generally accepted among investigators in this field that the strain of transmissible spongiform encephalopathy (TSE) responsible for the bovine spongiform encephalopathy (BSE) epidemic in the UK and the strain causing vCJD are identical and distinct from all other TSE strains characterized to date. Moreover, several factors have aroused concern that vCJD may lie outside the spectrum of even our limited knowledge of classic CJD and scrapie: the apparent ease with which BSE is transmitted orally, the readiness with which it has jumped species barriers (first to cattle from whatever species it originated in and then to domestic and wild cats, antelopes and finally humans), its unique clinical and histopathological presentation in humans, and recent reports that the protease-resistant protein amyloid (PrP^{res}) is recoverable from the highly hematogenous tonsillar tissue of patients with vCJD but not those with classic CJD. Is the tonsillar PrP^{res} transported there from the blood stream? Is there some essential hematogenous involvement in the pathogenesis that facilitates oral transmission and results in significant blood titres? (It is noteworthy that

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