

necroticans. This condition, also referred to as pigbel or Darmbrand (“fire belly”), is an often-fatal intestinal illness characterized by hemorrhagic, inflammatory or ischemic necrosis with pseudomembranes, although it preferentially involves the small bowel.<sup>3</sup> It is caused by the  $\beta$ -toxin of *Clostridium perfringens* type C. This toxin is encoded by a plasmid-borne gene, *cpb2*, and is potentially transferable to other clostridial species.<sup>4</sup> In certain developing countries (e.g., Papua New Guinea), enteritis necroticans has been controlled by immunization against  $\beta$ -toxin,<sup>5</sup> which underscores the importance of this protein in intestinal disease. In developed countries, the condition is limited to adults with chronic illnesses and malnutrition. Reduced gastric acidity is a known risk factor, possibly because the toxin is not destroyed under these conditions.<sup>3</sup> Interestingly, proton pump inhibitors and decreased gastric acidity may also be associated with an increased risk for severe CDAD in Quebec.<sup>6</sup>

Diagnostic tests for CDAD have been available for years and are based on detection of toxin B (cytotoxin assay) or toxins A and B (immunoassay). The current epidemic strongly favours consideration that increased virulence may be due to elaboration of another toxin not detected by standard tests. A search for such toxins might be worthwhile in accounting for the more severe CDAD seen in Quebec.

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#### [One of the authors responds:]

Don Vinh's hypothesis is interesting. However, the toxins of *Clostridium perfringens* essentially result in severe necrotizing enteritis, sparing the large bowel, in contrast to the hypervirulent *C. difficile*, which causes severe colitis,<sup>1</sup> with little involvement of the small bowel. Nevertheless, the mechanism postulated deserves further investigation.

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#### Reference

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