Who Is Telling Pregnant Women About Listeriosis?

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ABSTRACT

During pregnancy, a woman's immune system is compromised and she is at an increased risk of infection and illness. In particular, the risk of contracting foodborne listeriosis is 20 times greater for pregnant women than for other women of reproductive age. Considering the negative effects of listeriosis on the developing fetus and that more than 380,000 babies were born in Canada in 2010, listeriosis is an important public health concern.

And yet, in Canada, it is not clear who is responsible for educating pregnant women on the importance of safe food handling and the avoidance of high-risk foods. Not all women attend prenatal education classes and the circle of care during pregnancy is highly variable. Physicians, however, are very often included in the care circle and may represent a consistent, reliable and trustworthy source of food safety information. At present, only one province has prenatal records that prompt physicians to counsel pregnant women on food safety issues, though all include some assessment of nutrition, diet or supplement use. Improving provincial and territorial prenatal records may be one important way of helping to ensure that critical food safety information is reaching pregnant Canadians.

Key words: Food safety; health policy; listeriosis; pregnancy complications, infectious; professional role

La traduction du résumé se trouve à la fin de l'article.

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During pregnancy, a woman's immune system is compromised and she is at an increased risk of infection and illness.¹ Therefore, safe, proper food handling and preparation techniques that minimize the risk of food-borne illness are even more important during pregnancy than during other periods of adulthood. It is estimated that pregnant women are 20 times more likely than other women of reproductive age to contract listeriosis, a food-borne illness caused by *Listeria monocytogenes*.² While the symptoms of listeriosis tend to mild and flu-like for the mother, *L. monocytogenes* can be passed via the placenta to the fetus, where the consequences are more serious.³ Depending on when fetal infection occurs, listeriosis can lead to spontaneous abortion, premature delivery, stillbirth, or neonatal meningitis and septicemia.³

The 2008 outbreak of *L. monocytogenes* in deli meats reminded Canadians of the inherent risks in our food supply. The first known Canadian listeriosis outbreak occurred in 1981, affected 34 pregnant women, and resulted in 5 spontaneous abortions, 4 stillbirths, and 23 seriously ill premature and full-term infants.⁴ Since that time there have been eight additional outbreaks, three of which have involved pregnant women.⁵ The most recent outbreak involving pregnant women was in the fall of 2008.⁶ Of the 38 confirmed cases, 13 women were pregnant, 5 delivered prematurely, and 3 lost their babies at birth or shortly thereafter.⁶

Considering the seriousness of the consequences associated with fetal listeriosis and that more than 380,000 babies were born in Canada last year,⁷ the importance of educating pregnant women

about the dangers of high-risk foods and ways to minimize food-borne illness risks cannot be overstated. However, in Canada, it is not clear who is responsible for counselling pregnant women on listeriosis or other food safety issues during pregnancy such as *Salmonella*, *Vibrio*, and *Escherichia coli* O157:H7 infections or the importance of regulating fish consumption to limit mercury exposure.⁸ Thus, it is possible that many women are not receiving proper guidance on how to minimize unnecessary food safety risks for themselves and their babies.

Food safety knowledge for pregnancy

An Australian study of 562 mothers revealed that only 59% received information on food safety during their pregnancy. Forty-two percent received information directly from their doctor or midwife and 8% from prenatal education classes.⁹ When asked to identify foods that should be avoided during pregnancy because of listeriosis, mothers correctly identified soft cheeses (81%), chicken liver pâté (68%), deli meats (64%), cold smoked salmon (61%) and coleslaw (50%). Interestingly, 72% of mothers incorrectly identi-

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Figure 1. Excerpt from page 1 of Alberta's Prenatal Record

Medical History					28. Assisted Conception		Life Style, Psychosocial and Environmental History			
No	Mother	Father	extended Family		No	Yes	Concerns		Action/Referral	
					☐	☐ If yes:	No	Yes		
1. Auto-immune disorder	☐	☐	☐	☐	Ovulation induction	☐	31. Nutrition/calcium	☐	☐	
2. Bleeding/Clotting disorder	☐	☐	☐	☐	Intrauterine insemination	☐	32. Nausea/vomiting	☐	☐	
3. Diabetes	☐	☐	☐	☐	In vitro fertilization	☐	33. Food safety	☐	☐	
4. Developmental delay	☐	☐	☐	☐	Intracytoplasmic sperm injection	☐	34. Physical activity	☐	☐	
5. Hereditary conditions	☐	☐	☐	☐	Other, specify _____	☐	35. Sleep/rest	☐	☐	
6. Consanguinity	☐	☐	☐	☐			36. Dental hygiene/care	☐	☐	
7. Malformation/Birth Defects	☐	☐	☐	☐			37. Environment/occupation	☐	☐	
8. Cardiac	☐	☐	☐	☐			38. Culture/religion	☐	☐	
9. Psychiatric/depression	☐	☐	☐	☐	29. Medications and Alternate Therapies		39. Social support	☐	☐	
10. Anaesthetic problems	☐	☐	☐	☐	Folic acid at conception	☐ No ☐ Yes	40. Stress factors	☐	☐	
11. Hypertension	☐	☐	☐	☐	If yes, dose _____		41. Emotional/depression	☐	☐	
12. HIV	☐	☐	☐	☐	Prenatal Vitamins	☐ No ☐ Yes	42. Relationship stability	☐	☐	
13. Hepatitis B	☐	☐	☐	☐	If yes, specify _____		43. Seat belt in pregnancy	☐	☐	
14. Hepatitis C	☐	☐	☐	☐	Prescription Medications, specify _____		44. Personal safety/violence	☐	☐	
15. STI	☐	☐	☐	☐			45. Parenting readiness	☐	☐	
16. Tuberculosis	☐	☐	☐	☐			46. Sexuality	☐	☐	
17. Chickenpox immune	☐	☐	☐	☐			Substance Use During Pregnancy			
18. Asthma	☐	☐	☐	☐	Non-prescription/Herbal/Alternate Medications, specify _____		47. Tobacco	☐ Never ☐ Yes ☐ Quit	YYYY/MM/DD	
19. Epilepsy	☐	☐	☐	☐			Average # of cigs per day _____			
20. Major trauma	☐	☐	☐	☐			Nicotine replacement	☐ No ☐ Yes		
21. GI disorder	☐	☐	☐	☐			Second hand smoke	☐ No ☐ Yes		
22. Renal/Urinary tract	☐	☐	☐	☐			48. Alcohol	☐ Never ☐ Yes ☐ Quit	YYYY/MM/DD	
23. Thyroid	☐	☐	☐	☐			Average # of drinks per drinking day	☐ 1-2 ☐ 3-4 ☐ 5 or more		
24. Operations	☐	☐	☐	☐			Number of days per week that you drink	☐ 1-2 ☐ 3-4 ☐ 5-7		
25. Transfusions	☐	☐	☐	☐			How often do you have 3 or more drinks per day	_____		
26. Other, specify _____	☐	☐	☐	☐	30. Allergies	☐ No ☐ Yes				
	☐	☐	☐	☐	If yes, specify agent and reaction _____		49. Recreational drugs/solvents	☐ Never ☐ Yes ☐ Quit	YYYY/MM/DD	
27. Data unavailable	☐	☐	☐	☐						

Source: Government of Alberta. Alberta Prenatal Record, 2009. Available at: <http://www.aphp.ca/qualityimprovementforms.html> (Accessed May 5, 2011).

fied hot take-away chicken portions as a high-risk food for listeriosis. Bondarianzadeh and colleagues⁹ titled their article, "*Listeria* education in pregnancy: Lost opportunity for health professionals" and the title seems fitting within the Canadian context as well. A 2010 study of physicians, family practice residents, and midwives in British Columbia found that 88% of respondents were familiar with listeriosis, but only 18% knew that pregnant women are at a higher risk of contracting the infection.¹⁰ Furthermore, only 40.2% of respondents who provided prenatal care counselled pregnant women regularly on listeriosis risk factors. More specifically, only some of the respondents involved in prenatal or intrapartum care counselled on the risks associated with eating soft cheeses (41.1%), unpasteurized milk and milk products (47%), deli meat or raw hot dogs (24.8%), unwashed vegetables and fruits (11.9%), and refrigerated smoked seafood products (5.9%).

Sources of food safety information for pregnant women

The circle of care during pregnancy is highly variable. Depending on pregnancy specifics as well as social and environmental contexts, women may or may not come into contact with midwives, registered nurses, registered dietitians, and prenatal educators. Physicians, however, are often a common denominator in the circle of care. One representative study of Canadian maternity experiences found that 92.3% of women met with a physician at least once during their pregnancies.¹¹

To facilitate the transfer of important pregnancy information between members of the circle of care as well as between different health care facilities, Canadian provinces and territories have developed prenatal records.¹² These records help standardize the information both obtained from and delivered to pregnant women and are novel because they illuminate some of the information that is communicated to this vulnerable population. In Canada, each

province and territory has its own prenatal record with the exception of the Yukon, which uses the same record as British Columbia.¹² A copy of each of these prenatal records was obtained from government websites, the College of Physicians and Surgeons for that province/territory, or by directly contacting a practicing obstetrician/gynecologist in that province/territory. An excerpt from Alberta's Prenatal Record is shown in Figure 1.

Information on *nutrition/diet/supplementation*, *prenatal education*, and *food safety* was extracted from each record. *Nutrition/diet/supplementation* information was reviewed in order to establish the depth to which food is currently discussed during prenatal visits. Information related to *prenatal education* was reviewed because prenatal classes may be an important alternative source of food safety counselling.

The results of the data review are summarized in Table 1. Each province/territory's prenatal record included some context for discussing food and nutrition, though to varying depths. Prevalent nutrition prompts included those for folic acid (10 out of 12 provinces/territories), general nutrition, diet and healthy eating (9 out of 12), and prenatal vitamins (9 out of 12). Despite differences in the topic prompts, it is evident that health care professionals who fill out prenatal records are in the habit of discussing food and nutrition issues with pregnant women.

All prenatal records included some reference to prenatal education, with the exception of the record from Prince Edward Island. It has been observed in the literature that health care professionals who come in contact with only a small proportion of pregnant women may not see themselves as the primary source of food safety information and feel that this area of counselling would be better addressed by individuals who have access to the entire population.¹³ Prenatal education might meet this need as it provides the opportunity for a consistent, standardized approach for

Table 1. Summary of Nutrition, Prenatal Education and Food Safety Prompts on Provincial/Territorial Prenatal Records

Province/ Territory	Nutrition/Diet/Supplementation Prompt? (Nature of Prompts)	Prenatal Education Prompt?	Food Safety Prompt?
Alberta	Yes (Folic acid; prenatal vitamins; nutrition/calcium)	Yes	Yes
British Columbia (and Yukon)	Yes (Diet; folic acid; over-the-counter drugs/vitamins)	Yes	No
Manitoba	Yes (Nutrition concerns; folic acid; vitamins; nutrition)	Yes	No
Newfoundland and Labrador	Yes (Nutrition; special diet; folic acid; vitamins)	Yes	No
New Brunswick	Yes (Vitamin supplementation, diet and weight)	Yes	No
Northwest Territories	Yes (Nutrition; special diet; 24-hour food recall; food security; calcium; folic acid; iron; vitamins; prenatal nutrition program)	Yes	No
Nova Scotia	Yes (Folic acid; nutrition concern/food security; healthy eating; daily multivitamin containing folic acid and iron)	Yes	No
Nunavut	Yes (Nutrition; supplemental vitamins and iron; 24-hour recall; Canadian Prenatal Nutrition Program)	Yes	No
Ontario	Yes (Dietary restrictions; calcium; folic acid)	Yes	No
Prince Edward Island	Yes (Nutrition concern/food security; folic acid)	No	No
Quebec	Yes (Coffee; nutrition; folic acid)	Yes	No
Saskatchewan	Yes (Nutrition, folic acid; prenatal vitamins)	Yes	No

communicating food-borne illness risks to pregnant women. However, not all women choose to attend prenatal classes whereas all women receive some sort of medical attention from a physician or midwife. As well, one study found that women consider their physician to be the most trustworthy source of health information and were more likely to follow their advice than information received from all other sources.⁹

Considering the preeminent position held by physicians in Canadian society, they are likely an excellent source of food safety risk advice for pregnant women. And yet, only one prenatal record, from Alberta, prompted physicians to provide this critical information to their patients. The form guides physicians to discuss “Food quality/safety” issues at the first prenatal visit, i.e., when the woman is between 6 and 10 weeks pregnant. Alberta was also the only province to make use of a supplemental screening questionnaire designed to better identify risks for the expecting mother. Titled ‘Healthy Mother, Healthy Baby’, this questionnaire closely assesses risks to the baby associated with the mother’s diet and lifestyle. Included on this questionnaire are items that assess consumption frequencies of unpasteurized fruit juices and dairy products, and raw/undercooked food and beverages. As well, at the end of the questionnaire is a fact sheet for the mother’s reference, which outlines food safety risks during pregnancy, among other topics.

Need for change in Canada

At the federal level, there is no support for physicians who wish to discuss food safety risks with their pregnant patients and the Canadian Prenatal Nutrition Guidelines for Health Professionals make no mention of food safety risk reduction.¹⁴ Though Health Canada, the Public Health Agency of Canada, and the Canadian Food Inspection Agency have created resources that are targeted to pregnant women,⁸ physicians need separate guidelines and resources that are targeted to their specific needs to prepare them for this new counselling role in food safety.

Thus, with the exception of the province of Alberta, provincial, territorial and federal guidelines do not prompt physicians to discuss food safety issues with pregnant patients. Considering the importance of reducing food-borne illness risks during pregnancy, we need to acknowledge the gap in care that exists for expecting mothers. Physicians may be the best practitioners to provide this

information because they come into contact with the largest proportion of the population, they are already in the habit of counselling pregnant women on a variety of issues including diet, and they are considered the most trustworthy source of information by the public. Following Alberta’s lead, provinces and territories should consider adding prompts for physicians to discuss food safety issues to their prenatal records. Public health professionals were influential in advocating for the addition of alcohol prompts and may also have a role to play in advocating for the addition of food safety prompts.¹⁵ The prompts will serve as a reminder of this critical issue and will help pregnant women to have healthy pregnancies and healthy babies.

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RÉSUMÉ

Durant la grossesse, le système immunitaire de la femme est affaibli, et elle court un risque accru de contracter des infections et des maladies. En particulier, le risque de toxi-infection alimentaire à listeria chez les femmes enceintes est 20 fois supérieur à celui des autres femmes en âge de procréer. Étant donné que la listériose nuit au développement du fœtus et qu'il y a eu plus de 380 000 naissances au Canada en 2010, les infections à listeria sont un important problème de santé publique.

Pourtant, au Canada, personne n'est clairement responsable de sensibiliser les femmes enceintes à l'importance de manipuler les aliments de façon sécuritaire et d'éviter ceux qui présentent un risque élevé. Toutes les femmes ne s'inscrivent pas aux classes d'enseignement prénatal, et leur cercle de soins durant la grossesse varie beaucoup. Les médecins, toutefois, sont très souvent inclus dans ce cercle de soins et pourraient être une source d'informations cohérentes, fiables et dignes de foi sur la salubrité des aliments. Pour l'instant, une seule province tient des dossiers prénatals qui incitent les médecins à offrir aux femmes enceintes des conseils sur la salubrité des aliments, bien que toutes incluent une forme d'évaluation de l'état nutritionnel, du régime ou de la prise de suppléments nutritifs. Améliorer les dossiers prénatals provinciaux et territoriaux pourrait être un très bon moyen de faire en sorte que les Canadiennes enceintes reçoivent l'information essentielle sur la salubrité des aliments.

Mots clés : salubrité des aliments; politique sanitaire; infections à listeria; complications infectieuses de la grossesse; rôle professionnel

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Canada's food safety system is one of the best in the world. But despite the best efforts of government and industry who produce our food, as well as what we do as consumers to protect the safety of the food we eat at home, there are still 11 to 13 million cases of foodborne illness across the country each year. You can protect your own health by following some simple, practical advice about choosing, storing, and preparing your food.

Food safety is particularly important for people in specific higher-risk groups that are more vulnerable to germs that are sometimes carried in our food.

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EAT SAFE! is a new online resource that helps people minimize their personal risk from foodborne illness.

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The production of this resource targeted at higher-risk groups, their caregivers and the broader Canadian population was made possible through an unrestricted educational grant from Maple Leaf Foods Inc.

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