Prevalence of HIV infection in provincial prisons in British Columbia

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Objective: To ascertain the prevalence of HIV infection among people entering provincial adult prisons in British Columbia and to study associations between HIV infection and specific demographic and behavioural characteristics.
Design: Prospective, unlinked, voluntary survey involving HIV antibody testing of saliva specimens.
Setting: All adult provincial prisons in British Columbia through which inmates are admitted to the provincial correctional system.
Participants: All adult inmates admitted to provincial prisons in British Columbia between Oct. 1 and Dec. 31, 1992.
Outcome measures: Rate of HIV positivity. Independent variables included sex, native status (native or non-native), self-reported HIV status, age group and history of injection drug use.
Results: A total of 2482 (91.3%) of 2719 eligible inmates volunteered for testing. Refusal was not associated with sex, native status, self-reported HIV status or age group; inmates who reported a history of injection drug use were more likely than the others to refuse HIV antibody testing (12.9% v. 6.8%; $p < 0.001$). The 2482 inmates who were tested for HIV were similar to the general inmate population with regard to sex, native status and age group. A total of 28 inmates were confirmed to be HIV positive, for an overall prevalence rate in the study population of 1.1% (95% confidence interval 0.8% to 1.6%). The prevalence rates were higher among the women than among the men (3.3% v. 1.0%; $p = 0.023$, Fisher's exact test) and among the inmates who reported a history of injection drug use than among those who did not report such a history (2.4% v. 0.6%; $p < 0.001$). There was no association between HIV status and native status or age group. Logistic regression analysis revealed the higher prevalence rate among the women to be explained by more of the women than of the men reporting a history of injection drug use. Of the 30 people who stated that they were HIV positive and who were tested, 19 (63.3%) had a negative result; conversely, 17 who reported that they were HIV negative or had not been tested had a positive result.
Conclusions: Unlinked, voluntary HIV antibody testing of inmates can achieve high participation rates. The overall prevalence rate of 1.1% and the rate among the female inmates of 3.3% confirm that HIV infection is a reality in prisons and that the virus has established a clear foothold in inmate populations. Harm-reduction interventions should include a comprehensive education program for inmates on infectious diseases, the availability of condoms throughout prisons and the distribution of bleach for sterilizing needles and syringes. From a public health perspective, these data suggest an urgent need for access to sterile injection equipment in addition to other preventive measures.

Objectif : Déterminer la prévalence de l'infection au VIH chez les détenus qui arrivent dans les prisons provinciales pour adultes de la Colombie-Britannique et étudier les liens entre l'infection au VIH et certaines caractéristiques démographiques et comportementales précises.
Conception : Enquête prospective, non reliée, volontaire, comportant des essais de dépistage de l'anticorps du VIH dans des spécimens de salive.
Contexte : Toutes les prisons provinciales pour adultes de la Colombie-Britannique où des détenus sont admis dans le système correctionnel de la province.

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Participants : Tous les détenus adultes admis dans des prisons provinciales de la Colombie-Britannique entre le 1er octobre et le 31 décembre 1992.
Mesures des résultats : Taux de réactions anti-VIH positives. Les variables indépendantes comprenaient le sexe, le statut d'autochtone (autochtone ou non autochtone), le statut auto-déclaré par rapport au VIH, le groupe d'âge et les antécédents de consommation de drogues par injection.
Résultats : Au total, 2 482 (91,3 %) des 2 719 détenus admissibles se sont portés volontaires. On n'a établi aucun lien entre le refus et le sexe, le statut d'autochtone, le statut auto-déclaré par rapport au VIH ou le groupe d'âge. Les détenus qui ont déclaré avoir consommé des drogues par injection étaient plus susceptibles que les autres de refuser de se soumettre aux essais de dépistage des anticorps du VIH (12,9 % c. 6,8 %; $p < 0,001$). Les 2 482 détenus qui ont subi un test de dépistage des anticorps du VIH avaient des caractéristiques semblables à celles de la population générale des détenus en ce qui concerne le sexe, le statut d'autochtone et le groupe d'âge. Au total, on a confirmé que 28 détenus étaient porteurs du VIH, ce qui donne un taux de prévalence global dans la population étudiée de 1,1 % (intervalle de confiance à 95 % de 0,8 % à 1,6 %). Les taux de prévalence étaient plus élevés chez les femmes que chez les hommes (3,3 % c. 1,0 %; $p = 0,023$, méthode exacte de Fisher) et chez les détenus qui ont déclaré avoir consommé des drogues par injection que chez ceux qui ne l'avaient pas fait (2,4 % c. 0,6 %; $p < 0,001$). Il n'y avait aucun lien entre la séropositivité au VIH et le statut d'autochtone ou le groupe d'âge. Une analyse de régression logistique a révélé que la prévalence plus élevée chez les femmes pouvait s'expliquer par le fait que plus de femmes que d'hommes ont déclaré avoir consommé des drogues par injection. Parmi les 30 personnes qui ont déclaré être porteuses du VIH et qui ont subi des tests, 19 (63,3 %) ont obtenu un résultat négatif; par ailleurs, 17 qui avaient déclaré ne pas être porteuses du VIH ou ne pas avoir subi de test ont obtenu un résultat positif.
Conclusions : Les taux de participation aux essais volontaires non reliés de dépistage de l'anticorps du VIH chez les détenus peuvent être élevés. Le taux de prévalence générale de 1,1 % et le taux chez les détenues, qui s'établit à 3,3 %, confirment que l'infection au VIH est une réalité dans les prisons et que le virus est bien implanté dans les populations carcérales. Les interventions de réduction du danger devraient comprendre un programme d'éducation détaillé sur les maladies infectieuses à l'intention des détenus, la disponibilité de condoms dans toutes les prisons et la distribution d'eau de javel pour stériliser les aiguilles et les seringues. Dans une optique de santé publique, ces données indiquent qu'il est urgent d'avoir accès à du matériel d'injection stérile en sus d'autres mesures préventives.

From a public health perspective prisons are essentially environments in which certain conditions exist and behaviours occur that affect disease transmission, within both the prison and the community in general. Needle sharing and sexual activity, although prohibited in prison, nevertheless take place covertly among people who often already have a history of similar high-risk behaviours before incarceration. There have been reports that 20% to 33% of male inmates in US federal institutions engage in homosexual activity while incarcerated.[1,2] In some studies[1,3] up to 25% of inmates have reported injection drug use while in prison. Disease transmission in prisons is well known[4,5] and was underscored recently with reports of an investigation of an outbreak of hepatitis B and HIV infection among inmates in a Scottish prison.[6]

The prevalence of HIV infection in an entire provincial adult correctional system has not previously been published. A study involving incarcerated men in two provincial prisons in Quebec revealed rates of 4.7% and 2.0% respectively.[7] A similar study involving incarcerated women volunteering to be tested in a medium-security prison in Quebec revealed a prevalence rate of 7.7% (19 of 248 women).[8] However, in neither study did the investigators claim to estimate the overall seroprevalence, because participation was inmate-initiated and the sampled populations were not truly representative of the entire provincial inmate population.[8] An HIV prevalence study of urine samples from inmates in Ontario is currently under way.

We report here the results of a voluntary, anonymous HIV prevalence survey of all adult inmates admitted to provincial prisons in British Columbia between Oct. 1 and Dec. 31, 1992. The purposes of the study were to obtain a reliable estimate of the magnitude of the problem of HIV infection in provincial prisons in the province, to identify certain high-risk groups or types of inmates for targeted prevention programs and health care resource allocation, and to support the need for education and specific harm-reduction measures for inmates.

Methods

In early 1992, after careful review of the research protocol, the Corrections Branch of the Ministry of the Attorney General of British Columbia gave final approval for a study of the prevalence of HIV infection among inmates in British Columbia prisons. The protocol had first received ethical and legal approval from the ministry's Legal Services Branch and was reviewed and approved by the British Columbia Civil Liberties Association. The study was also discussed and approved by

two inmate committees. Voluntary, confidential serum HIV antibody testing with pretest and post-test counselling is offered to all new inmates and is available on request throughout incarceration in British Columbia.

Data collection and antibody testing were performed from Oct. 1 to Dec. 31, 1992. During this period all adults being admitted to a prison in British Columbia were eligible for participation in the study. Subjects were only entered into the study once, even if they were readmitted during the study period. The study was conducted in all seven provincial prisons through which inmates are admitted to the provincial correctional system.

All inmates underwent the usual entry evaluation, which included a medical history and physical examination. In addition, personal and demographic data were recorded, including sex, native status (native or non-native), intake correctional facility, age group and history of injection drug use. As well, each inmate was asked Do you know whether you are HIV positive?

Because biologic specimens are not routinely collected from inmates being admitted to provincial prisons in British Columbia, a nonvoluntary, anonymous HIV prevalence study was not possible. Instead, we performed a voluntary survey that involved the collection of saliva specimens. We chose to test saliva because we wanted to avoid the risk and inconvenience inherent in the drawing, handling and disposing of blood and because we felt this would be more acceptable to the participants. The HIV antibody testing procedure and reasons for the study were explained to each inmate. Saliva specimens were assigned a four-digit code and were linked only to the subjects' demographic and risk-factor data, not their identities.

The saliva samples were collected onto a piece of absorbent paper, which was then placed in an appropriate collecting tube (OMNI-SAL Sterile Collection Device, Saliva Diagnostic Systems, PTE Ltd., Singapore) and sent to the Provincial Laboratory of the British Columbia Centre for Disease Control. Specimens were tested by means of the enzyme immunoassay (Recombigen HIV-1 EIA kit; Cambridge Biotech, Cambridge, Mass.). The sensitivity and specificity of this assay for testing saliva have been found to be 98.3% and 100% respectively, on the basis of the correct identification of 117 of 119 positive and 429 of 429 negative specimens.[9] Another study has also established the reliability of testing saliva for HIV antibodies.[10] All positive results were confirmed by means of radioimmunoprecipitation at the Provincial Laboratory.

To assess the comparability of the inmates in the study and the total inmate population in British Columbia we obtained information on the sex, native status and age of all inmates in prisons in the province during February 1993.

Proportions were compared using the χ^2 test or Fisher's exact test when cell sizes warranted. All p values were two-sided, and 95% confidence intervals (CIs) were calculated with the use of exact methods. As well, for each prevalence estimate based on the study population, a corresponding minimum estimate was calculated based on the total eligible population, with all inmates who refused to participate being considered HIV negative. Stepwise logistic regression was used to adjust for potential confounding variables.

Results

A total of 2719 adult inmates were eligible for the study. Data were complete for all subjects except five: for three of these, data on injection drug use were unavailable, and for two, data on self-reported HIV status were unavailable. Of the 2719 subjects 237 (8.7%) refused to be tested. Table 1 presents the demographic and behavioural characteristics of the eligible population as well as the refusal rates. The refusal rates did not differ by sex, native status, knowledge of HIV status or age group. In contrast, the refusal rate was significantly higher among those who reported a history of injection drug use than among those who did not report such a history ($p < 0.001$).

The 2482 subjects who agreed to undergo HIV antibody testing were similar to the general inmate population with regard to sex, native status and age group (Table 2).

Of the subjects tested, 28 were confirmed to be HIV positive, for an overall prevalence rate in the study population of 1.1% (95% CI 0.8% to 1.6%) (Table 3). The women had a significantly higher prevalence rate than the men ($p = 0.023$, Fisher's exact test). There was no association between HIV positivity and native status. Although the prevalence rate was highest among the inmates aged 20 to 39, this finding was not statistically significant. Inmates reporting a history of injection drug use were four times as likely as those not reporting such a history to be HIV positive ($p < 0.001$).

Not surprisingly, the subjects who reported that they were HIV positive were far more likely to have a positive test result than those who said that they were HIV negative or did not know their HIV status ($p < 0.001$) (Table 3). However, of the 30 people who said that they were HIV positive and who were tested, only 11 (36.7%) had a positive result. Moreover, the number of inmates who said that they were HIV positive and who turned out to be HIV negative was similar to the number who said that they were HIV negative or did not know their HIV status and turned out to be HIV positive (19 and 17 respectively).

Because of the association between HIV positivity and injection drug use we explored associations between this risk factor and the other demographic variables. The women were more likely than the men to report a history of injection drug use (54.0% v. 28.5%; $p < 0.001$). The proportions of native and non-native inmates who reported a history of injection drug use were similar

(32.5% and 29.3%; $p = 0.14$). The subjects who said that they were HIV positive were more likely than the others to report a history of injection drug use (73.3% v. 29.5%; $p < 0.001$). Self-reported injection drug use was associated with age ($p < 0.001$); the rates of such use ranged from as high as 42% (among those aged 30 to 39) to 10% (among those aged 50 or more).

The higher prevalence of HIV infection among the female inmates was explained almost entirely by the higher proportion of injection drug use among the women. Indeed, all five women who were HIV positive reported a history of injection drug use, as compared with 13 (56.5%) of the 23 men who were HIV positive. In a logistic regression analysis of HIV status with sex, native status, age group and history of injection drug use as independent variables, only history of injection drug use was significantly associated with HIV infection.

Discussion

This study was the first province-wide investigation of HIV prevalence in provincial prisons. Moreover, all people entering such facilities were included over a defined period, and a remarkably high participation rate (91.3%) was achieved. Thus, the study provides a reliable assessment of the extent of HIV infection among people entering prisons in British Columbia.

It is well known that surveys of HIV infection in various populations are highly sensitive to volunteer bias.[11,12] The potential effect of this bias was minimized in our study, given the high participation rate. Moreover, refusal was not significantly associated with any of the demographic variables available to us, and the group tested was found to be similar to the overall inmate population with regard to sex, native status and age group. In contrast, people who reported a history of injection drug use were more likely than the other inmates to refuse testing and were more likely to be HIV positive;

Table 2: Demographic characteristics of the study inmates and of all inmates in provincial prisons in British Columbia

Characteristic	Population; no. (and %) of inmates: Study population	All prisoners*
Sex		
Female	150 (6.0)	(5.0)
Male	2332 (94.0)	(95.0)
Native status		
Native	572 (23.0)	(17.7)
Non-native	1910 (77.0)	(82.3)
Age group, yr		
< 20	208 (8.4)	(8.2)
20–29	1152 (46.4)	(43.8)
30–39	728 (29.3)	(30.3)
40–49	290 (11.7)	(12.7)
≥ 50	104 (4.2)	(6.0)

*Based on a census of all inmates of provincial adult prisons in British Columbia during February 1993.

Table 1: Demographic and behavioural characteristics of inmates admitted to provincial adult prisons in British Columbia from Oct. 1 to Dec. 31, 1992, who participated in an HIV prevalence study, and refusal rates

Characteristic	No. (and %) of inmates: Eligible	Refused	*p* value
Sex			
Female	163 (6.0)	13 (8.0)	
Male	2556 (94.0)	224 (8.8)	0.73
Native status			
Native	622 (22.9)	50 (8.0)	
Non-native	2097 (77.1)	187 (8.9)	0.49
Self-reported HIV status*			
Positive	33 (1.2)	3 (9.1)	
Negative or unknown	2684 (98.8)	234 (8.7)	0.76
Age group, yr			
< 20	222 (8.2)	14 (6.3)	
20–29	1256 (46.2)	104 (8.3)	
30–39	812 (29.9)	84 (10.3)	
40–49	317 (11.7)	27 (8.5)	
≥ 50	112 (4.1)	8 (7.1)	0.29
Self-reported history of injection drug use	*n = 2716*		
Yes	854 (31.4)	110 (12.9)	
No	1862 (68.6)	127 (6.8)	< 0.001
All	2719	237 (8.7)	

*Missing data for 2 cases.

therefore, the overall prevalence rate is likely somewhat higher than that found.

At the very least, the low refusal rate allowed us to calculate minimum prevalence estimates based on the optimistic assumption that all nonparticipants were HIV negative. Using this approach, one can conclude with certainty that the true prevalence rates were no less than 1.0% overall, and 3.1% and 0.9% respectively among the female and male inmates entering British Columbia prisons during the study period.

This minimum prevalence rate of 1.0% is several times higher than the estimated rate of 0.1% to 0.2% in the overall adult population of British Columbia (Dr. Michael Rekart, Division of STD Control, British Columbia Ministry of Health: personal communication, 1993). This difference highlights the concentration of those with high-risk behaviours among the inmate population. In our study the women had a significantly higher HIV prevalence rate than the men. This observation is far from unique: higher prevalence rates in female inmate populations have been observed in prisons in Quebec,[7,8] New York City,[13] Spain[14] and the United States.[15] Of 10 unidentified correctional systems in the United States with high prevalence rates 9 were found to have higher rates among female inmates than among male inmates.[15] In our study the multivariate analysis revealed that the higher rate among the women was due to a greater proportion of women reporting a history of injection drug use. This association is likely due to a much closer relation between drug use, prostitution and incarceration among women than among men.

Injection drug use was highly correlated with HIV positivity: the relative risk of an injection drug user being HIV positive was more than four times that of a nonuser. As noted previously, since the inmates who reported a history of injection drug use were almost twice as likely as the other inmates to refuse testing, the actual HIV prevalence rate in the former group may have been higher than reported. However, the prevalence rate of HIV infection in this group was similar to the rate among injection drug users in the British Columbia provincial testing program (2.4% and 2.2% respectively).[16] In our study, although all 5 women who had a positive test result reported a history of injection drug use, only 13 (56.5%) of the 23 men with such a result reported that behaviour. This suggests the presence of other risk factors, presumably high-risk sexual activity, for the male participants. Other risk factors cannot be ruled out for the women, since one cannot discern from these data whether HIV infection in women was acquired through injection drug use or sexual activity associated with that behaviour. A limitation in this regard is that we did not obtain information about prostitution; however, Hankins and associates[17] did not find prostitution to be a risk factor for HIV positivity among incarcerated women in Quebec.

Only 11 (39.3%) of the 28 inmates who were found to be HIV positive reported that they knew they were

Table 3: HIV prevalence rates in the study population, by demographic and behavioural characteristics

Characteristic	Sample size	No. who were HIV positive	HIV prevalence rate (and 95% CI*), %		*p* value	Minimum estimate†
Sex						
Female	150	5	3.3	(1.2–8.0)		3.1
Male	2332	23	1.0	(0.6–1.5)	0.023‡	0.9
Native status						
Native	572	5	0.9	(0.3–2.2)		0.8
Non-native	1910	23	1.2	(0.8–1.8)	0.51	1.1
Self-reported HIV status						
Positive	30	11	36.7	(20.5–56.1)		33.6
Negative or unknown	2450	17	0.7	(0.4–1.1)	< 0.001‡	0.6
Age, yr						
< 20	208	1	0.5	(0.0–3.1)		0.5
20–29	1152	15	1.3	(0.8–2.2)		1.2
30–39	728	9	1.2	(0.6–2.4)		1.1
40–49	290	3	1.0	(0.3–3.2)		0.9
≥ 50	104	0	0.0	(0.0–4.4)		0.0
Self-reported history of injection drug use						
Yes	744	18	2.4	(1.5–3.9)		2.1
No	1735	10	0.6	(0.3–1.1)	< 0.001	0.5
All	2482	28	1.1	(0.8–1.6)		1.0

*CI = confidence interval.
†Calculated on the basis of the total eligible study population, under the assumption that all inmates who refused were HIV negative.
‡Fisher's exact test.

positive. This could have been intentional underreporting on the part of some; for others, a worrisome conclusion may be that, as in the community, many infected people do not know that they are HIV positive and therefore may be less likely to take precautions to prevent infecting others, either in prison or in the community.

Interestingly, we found a high level of overreporting: 19 of the inmates who said that they were HIV positive turned out to be HIV negative. This was quite unexpected, and the reasons for it are unclear. Some of the subjects may have misinterpreted the question. In some cases the saliva test may have yielded false-negative results, but with a sensitivity in the range of 98% this is unlikely and would have affected at most one or two subjects. The fact that 13 (68.4%) of these 19 inmates reported a history of injection drug use suggests that some simply assumed themselves to be HIV positive on the basis of their previous risk behaviour. It is even conceivable that some may have intentionally lied about being HIV positive because of a perceived secondary gain, such as special privileges and protected status. In any case, these data suggest that prison officials should exercise caution in labelling inmates on the basis of their self-reports of HIV infection alone. The results also underscore the importance of offering confidential, voluntary HIV antibody testing, with appropriate pretest and post-test counselling.

Although the association of HIV infection with age was not statistically significant (1750 subjects per group would have been required to detect a difference in prevalence between 0.5% in one age group and 1.5% in another with 80% power), it is interesting that the rate was highest in the group of inmates 20 to 29 years and that 15 of the 28 inmates found to be HIV positive were in that age group. These findings support the need to start education and preventive measures as early as possible in schools, with material that is understandable and appealing to young people, as well as the need to develop targeted interventions for adolescents and young adults who have dropped out of school. A voluntary HIV prevalence study involving young offenders admitted to youth custody centres in British Columbia is now under way.

In summary, we found that an unlinked, voluntary HIV antibody survey of prisoners can achieve a high participation rate. Our finding of a minimum rate of HIV infection of 1.0% overall and of 3.1% among female inmates confirms that HIV infection is a reality in prisons and that the virus has established a clear foothold in inmate populations. Those who are awaiting evidence for the presence of HIV in prisons before they commit themselves to addressing the problem need not wait any longer. The options are to remove the risk behaviours or to remove the harm. Eliminating sexual activity and needle sharing in prisons, even if this were possible, would provide only a short-term solution, because it would have little impact on risk behaviour once the inmates were released. Consequently, efforts must be aimed at reducing the harm from these activities. These efforts will help prevent not only transmission inside prisons but also risk behaviour back in the community after release. Such harm-reduction interventions include a comprehensive education program for inmates on infectious diseases, the availability of condoms throughout prisons and the distribution of bleach for sterilizing needles and syringes. The reporting of a history of injection drug use by all of the HIV-positive women in our study and 57% of the HIV-positive men suggests an urgent need for access to sterile injection equipment in prisons so that contaminated equipment will not be shared. Although we recognize that needle-exchange programs may pose certain prison security difficulties, from a public health perspective we believe that the benefits outweigh the risks.

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Oct. 31–Nov. 5, 1994: Canadian Society of Forensic Medicine and the Northwest Association of Forensic Scientists Joint Meeting
Vancouver
Jeffrey Caughlin, RCMP Forensic Laboratory, 5201 Healther St., Vancouver, BC V5Z 3L7; tel (604) 264-3507, fax (604) 264-3499

Nov. 2–5, 1994: American Medical Writers Association Annual Conference
Phoenix
American Medical Writers Association, 9650 Rockville Pike, Bethesda, MD 20814-3998; tel (301) 493-0003, fax (301) 493-0005

Le 4 nov. 1994 : Colloque Femmes médecins : du rêve à la réalité . . .
Montréal
Crédits d'éducation médicale continue
M^me^ Christiane Beaudoin, Corporation professionnelle des médecins du Québec, 2170, boul. René-Lévesque O, Montréal, QC H3H 2T8; tél (514) 933-4441, fax (514) 933-3112

Nov. 4–5, 1994: Medical Challenges in Long Term Care (sponsored by the BC Association of Geriatric Care Physicians and the Division of Community Geriatrics, University of British Columbia)
Vancouver
Study credits available.
Medical Challenges in Long Term Care, conference secretariat, 645–375 Water St., Vancouver, BC V6B 5C6; tel (604) 681-5226, fax (604) 681-2503

Nov. 4–6, 1994: 2nd Annual Violence Education Conference — Working in Communities: Community-Based Approaches to Violence Education
Albuquerque, NM
Program Department, Society of Teachers of Family Medicine, PO Box 8729, Kansas City, MO 64114; tel (800) 274-2237, (816) 333-9700, ext. 4510

Nov. 6–8, 1994: 8th British Columbia HIV/AIDS Conference — Focus on Youth (cosponsored by the Ministry of Health, the BC Centre for Excellence in HIV/AIDS, St. Paul's Hospital)
Vancouver
Elaine Liau, conference services manager, Division of Interprofessional Continuing Education, Continuing Education in the Health Sciences, University of British Columbia, 105–2194 Health Sciences Mall, Vancouver, BC V6T 1Z3; tel (604) 822-2626, (604) 822-4965, fax (604) 822-4835

Nov. 6–11, 1994: International Seminar on Women and Disability
Tel Aviv, Israel
Dr. E. Chigier, International Forum on Sexuality and Disability, Israel Rehabilitation Society, 18 David Elazar St., Tel Aviv, Israel 61909; fax 011-9723-691-9885

Nov. 7–9, 1994: Ontario Hospital Association Annual Convention and Exhibition: Redesigning Health Care for Today and Tomorrow
Toronto
Keynote speaker: Rosabeth Moss Kanter
Education and Convention Services, Ontario Hospital Association, 7th floor, 150 Ferrand Dr., Don Mills, ON M3C 1H6; tel (416) 429-2661, ext. 5590; fax (416) 429-5651

Nov. 8, 1994: Ethical Dilemmas in Rehabilitation: Making Tough Decisions
Ottawa
Guest speaker: Dr. Abbyann Lynch
Zachary Muroff, chairperson, Rehabilitation Education Day, Ottawa Civic Hospital, 1053 Carling Ave., Ottawa, ON K1Y 4E9; tel (613) 761-4722, fax (613) 725-2909

Nov. 10–12, 1994: Ontario College of Family Physicians 32nd Annual Scientific Meeting
Toronto
Ontario College of Family Physicians, 2630 Skymark Ave., Mississauga, ON L4W 5A4; tel (905) 629-1600, fax (905) 629-4810

Nov. 10–13, 1994: American Pain Society 13th Annual Scientific Meeting
Miami Beach, Fla.
Keynote speaker: Elie Wiesel
Study credits available.
Kathy Billa, American Pain Society, 5700 Old Orchard Rd., 1st floor, Skokie, IL 60077-1057; tel (708) 966-5595, fax (708) 966-9418

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