



BC Cancer Agency
CARE & RESEARCH

**CERVICAL CANCER
SCREENING PROGRAM**

An agency of the Provincial Health Services Authority

2005 ANNUAL REPORT

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TABLE OF CONTENTS

PROGRAM OVERVIEW	1
PROGRAM RESULTS	3
UTILIZATION	3
PARTICIPATION RATES.....	5
SCREENING INTERVAL	6
QUALITY OF SMEARS.....	8
CERVICAL SMEAR RESULTS.....	9
FOLLOW-UP OF ABNORMALS	11
FOLLOW-UP RECOMMENDATION	11
COMPLIANCE TO COLPOSCOPY RECOMMENDATIONS	12
POSITIVE PREDICTIVE VALUE OF CYTOLOGY.....	13
PROVINCIAL COLPOSCOPY PROGRAM	14
CANCER STATISTICS	15
INVASIVE SQUAMOUS CARCINOMA: 2003	16
ADENOCARCINOMA: 2003	17
SPECIAL REPORT	18
10 YEAR PARTICIPATION PATTERN IN CERVICAL SCREENING	18
ACKNOWLEDGMENT	22
CONTRIBUTORS	23
PUBLICATIONS	24
SCREENING PROGRAM OVERVIEW.....	25
CCSP SCREENING RECOMMENDATIONS	27
COLPOSCOPY CLINIC LOCATIONS AND PERSONNEL STAFFING	28
EDUCATIONAL MATERIAL	29
REQUEST FOR EDUCATIONAL MATERIAL	30



TABLES

Table I	Smears Received by Age Group: 2004	3
Table II	Patients by Age Group: 2004.....	4
Table III	Number of Smears in Patients With Cervical/Endocervical Smears: 2004	4
Table IV	Participation Rates (%) by Age Groups July 2002 - December 2004.....	5
Table V	Cumulative Numbers and Proportions Rescreened	6
Table VI	Smear Quality by Age Group: 2004.....	8
Table VII	Distribution of Cytology Findings by Age Group Based on Patient's Last Cervical/Endocervical Smear in 2004.....	9
Table VIII	Significant Atypia Rates (per 1000) by Age Group Based on Patient's Last Cervical/Endocervical Smear in 2004.....	10
Table IX	Follow-up Recommendation by Age Group Based on Patients with Finding of Mild or Higher Atypia in 2004	11
Table X	Most Severe Histological Diagnosis within One Year of Last Cervical/Endocervical Pap Smear of 2003.....	13
Table XI	Invasive Cervical Cancers by Age Group	15
Table XII	Screening History for Invasive Squamous Cell Cervical Cancer Patients by Age Group: 2003.....	16
Table XIII	Screening History for Invasive Adenocarcinoma Cervical Cancer Patients by Age Group: 2003.....	17

FIGURES

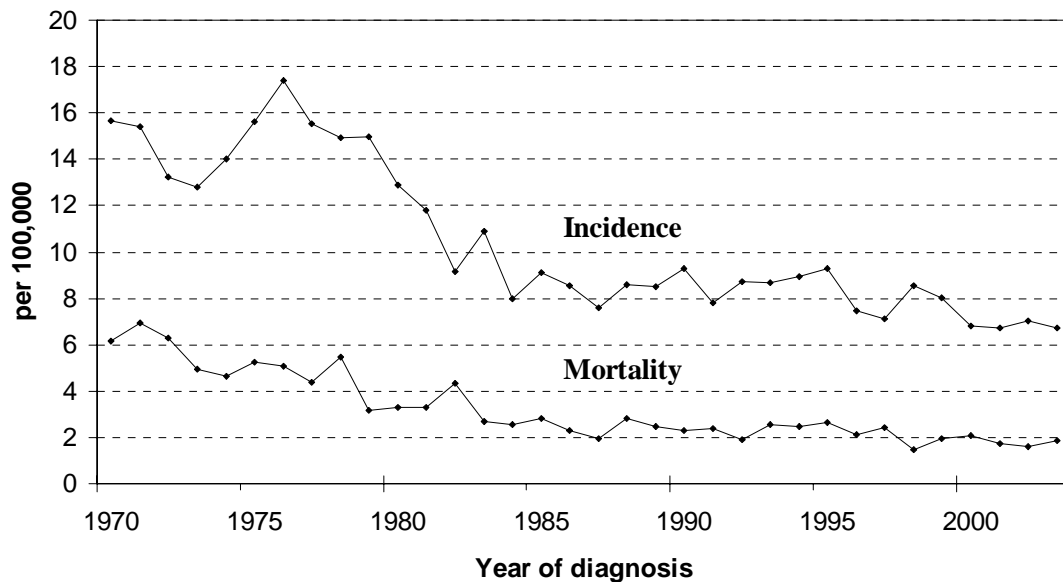
Figure 1	Age Standardized Incidence and Mortality Rate of Invasive Cervical Cancer in BC	1
Figure 2	Test Volume	2
Figure 3	Rescreening Rate for 2001 Patients by Recommended Interval.....	7
Figure 4	Level of Compliance to Colposcopy Recommendation by Age Group Patient's Last Cervical/Endocervical Smear in 2004.....	12
Figure 5	Reason for Referral to Colposcopy Clinic: 2004.....	14
Figure 6	Site of Colposcopic Investigation: 2004.....	14
Figure 7	Number of Pap Smear Requisitions Received by CCSP by Year Smear Was Taken.....	18
Figure 8	Number of Women in BC Having Pap Smears from Cervix/Endocervix by Year Smear Was Taken	19
Figure 9	Participation in Screening by Women Aged 20-69 Years, Over 36 Month Time Periods.....	20
Figure 10	Participation in Screening by New and Returning Patients, Over 36 Month Time Periods From 1995-1997 to 2002-04.....	21

PROGRAM OVERVIEW

The year 2005 marked a significant change to the Cervical Cancer Screening Program (CCSP). The Provincial Health Service Authority (PHSA) integrated laboratory services from all PHSA agencies into a united organization, PHSA Laboratories. The CCSP will no longer provide the gynecological cytology services, but will receive test results from the PHSA Laboratories, and continue as a program of the BC Cancer Agency to provide functionalities of an organized population screening program: health promotion, recruitment & retention, patient follow-up reminder, evaluation & research partnership in screening.

Since the introduction of the CCSP in 1960, the incidence and mortality rates in BC have declined by over 60%. Papanicolaou (Pap) test has enabled detection and treatment of pre-cancerous conditions. Cervical carcinoma is now the 12th most common malignancy diagnosed in women of British Columbia. In 2003, 148 women in BC were diagnosed with invasive carcinoma of the cervix.

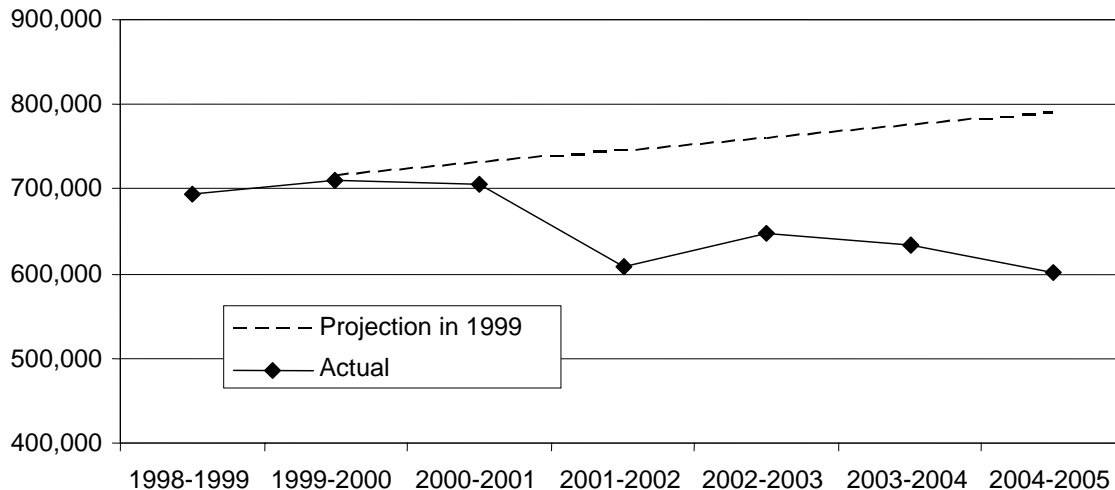
Figure 1
Age Standardized Incidence and Mortality Rate of Invasive Cervical Cancer in BC



* Rates are standardized to the 1991 Canadian population.

Over the past eight years, concerted efforts were made to promote effective utilization of the Pap tests. Without interventions, the test volume was projected to outpace population growth (see Figure 2). These activities have reduced over-utilization while increasing the appropriate screening participation. The special section on participation in this report provides further details, and shows in conclusion, the need to develop strategies to encourage young women to incorporate cervical screening into their regular health practice.

Figure 2
Test Volume



Cervical cancer control is moving into a new era. Research over the last 20 years has conclusively demonstrated that genital infection with particular types of human papilloma viruses, so called high risk types, are necessary for the development of cervical cancer. This has led to the development and testing of vaccines aimed at preventing the establishment of persistent infection by some of these high risk types. These vaccines are showing great promise among women who have not previously been infected and it is anticipated that they will soon be licensed for use. However they are not anticipated to be 100% effective at preventing cervical cancer since they do not provide protection against all high risk types. A second area of development is the use of an HPV test as a replacement for the Pap test in women over the age of 30. A single HPV test has been shown to be considerably more sensitive than a single Pap smear although the effect of using HPV in routine screening is less clear. The program hopes to undertake research into this question in the near future.

The year 2005 is also marked by another significant change. It is with great regret that we accepted Dr. Jasenka Maticic's retirement. As the Medical Leader over the past 7 years, she has provided strong leadership with humour and spirited enthusiasm. Her contributions are evident, and she will be sorely missed.

PROGRAM RESULTS

Utilization

The Cervical Cancer Screening Program (CCSP) received a total of 607,387 gynecological smears from BC health care professionals in 2003. Health care professionals who submitted smears include gynecologists, general practitioners, midwives, naturopaths, nurses, etc. An additional 8,288 smears were submitted from outside of BC, of which the majority originated in the Yukon Territory. The following program results include smears from British Columbia only.

**Table I
Smears Received by Age Group: 2004**

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Smears	27,535	121,543	147,099	149,173	100,654	47,338	9,991	603,333
Smears from Cervix/Endocervix (%)	27,502 (99.9)	121,374 (99.9)	145,912 (99.2)	143,672 (96.3)	91,160 (90.6)	40,225 (85.0)	6,933 (69.4)	576,778 (95.6)
Smears from Other Sites (%)	33 (0.1)	169 (0.1)	1,187 (0.8)	5,501 (3.7)	9,494 (9.4)	7,113 (15.0)	3,058 (30.6)	26,555 (4.4)

Table I shows the number of smears received and age distribution. Smears from “other sites” are those without any cells taken from the cervix or endocervix. The population of women screened by the CCSP includes clinically asymptomatic women (routine screening), follow-up screening for women with previously detected abnormalities, and a small percentage of symptomatic women.

**Table II
Patients by Age Group: 2004**

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients	25,340	111,029	135,471	140,930	95,972	45,416	9,401	563,559
With Smears from Cervix/Endocervix Site (%)	25,331 (100)	110,942 (99.9)	134,456 (99.3)	135,883 (96.4)	87,141 (90.8)	38,892 (85.6)	6,664 (70.9)	539,309 (95.7)
With Smears from non Cervix/Endocervix Site (%)	9 (0.0)	87 (0.1)	1,015 (0.7)	5,047 (3.6)	8,831 (9.2)	6,524 (14.4)	2,737 (29.1)	24,250 (4.3)

Table II shows the number of patients who had Pap smears. The numbers of patients is given in total, and by patients with smears from the cervix or endocervix and those with smears only from other sites.

**Table III
Number of Smears in Patients With Cervical/Endocervical Smears: 2004**

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients	25,331	110,942	134,456	135,883	87,141	38,892	6,664	539,309
with 1 Smear (%)	23,651 (93.4)	101,187 (91.2)	123,292 (91.7)	128,230 (94.4)	83,046 (95.3)	37,525 (96.5)	6,379 (95.7)	503,310 (93.3)
with 2 Smears (%)	1,605 (6.3)	9,362 (8.4)	10,710 (8.0)	7,359 (5.4)	3,963 (4.5)	1,326 (3.4)	267 (4.0)	34,592 (6.4)
with 3+ Smears (%)	75 (0.3)	393 (0.4)	454 (0.3)	294 (0.2)	132 (0.2)	41 (0.1)	18 (0.3)	1,407 (0.3)
New Patients (%)	13,410 (52.9)	17,937 (16.1)	8,445 (6.2)	4,673 (3.4)	2,268 (2.6)	1,212 (3.1)	343 (5.1)	48,288 (8.9)

Table III shows the number and percentage of women having one, two, and three or more cervical/endocervical smears in the given year. Also shown is the number of women being screened by the CCSP for the first time, and the percentage they represent of all women screened.

Participation Rates

The CCSP recommends that women begin Pap smear screening for cervical abnormality when they become sexually active or soon thereafter, and stop screening at age 69 if no significant abnormality was detected during their screening history. Most women follow a one-year to two-year screening interval. Thus, participation rates for the CCSP are calculated as the percent of women with at least one cervical/endocervical smear in a 30-month period.

The CCSP does not currently collect patient residential information from the health care providers who submit the Pap smears for interpretation. Linkage with the Ministry of Health Client Registry is necessary to provide the data to calculate the regional participation rates. Unfortunately, this linkage was not possible this year. Thus, only province-wide participation rates are available.

Table IV
Participation Rates (%) by Age Groups
July 2002 - December 2004

	Age (years)							Age 20-69
	<20	20-29	30-39	40-49	50-59	60-69	70+	
British Columbia overall	8.6	64.5	72.1	63.6	51.8	39.0	7.0	60.1
Adjusted for Hysterectomy	8.6	64.5	78.4	80.5	77.4	62.9	10.8	73.9

Notes:

- 2004 population estimates: BC STATS, BC Ministry of Finance and Corporate Relations
- Population data was acquired through the Health Data Warehouse, BC Ministry of Health
- Hysterectomy rates were estimated from a population sample of an epidemiological study conducted in 1995

Table IV lists the 10-year age group breakdown of participation rates for the 30-month period ending on December 31 in the year of this report. Participation is shown based on the entire BC population, and also adjusted for hysterectomies. The hysterectomy adjustment is based on the estimated age specific hysterectomy rates to exclude women without a cervix.

Screening Interval

Repeat interval recommendations were given based primarily on the current smear result and cytology history, but might be influenced by the patient's clinical condition. In order to have sufficient follow-up time, the last smear per patient taken in 2001 was used in the screening interval analyses.

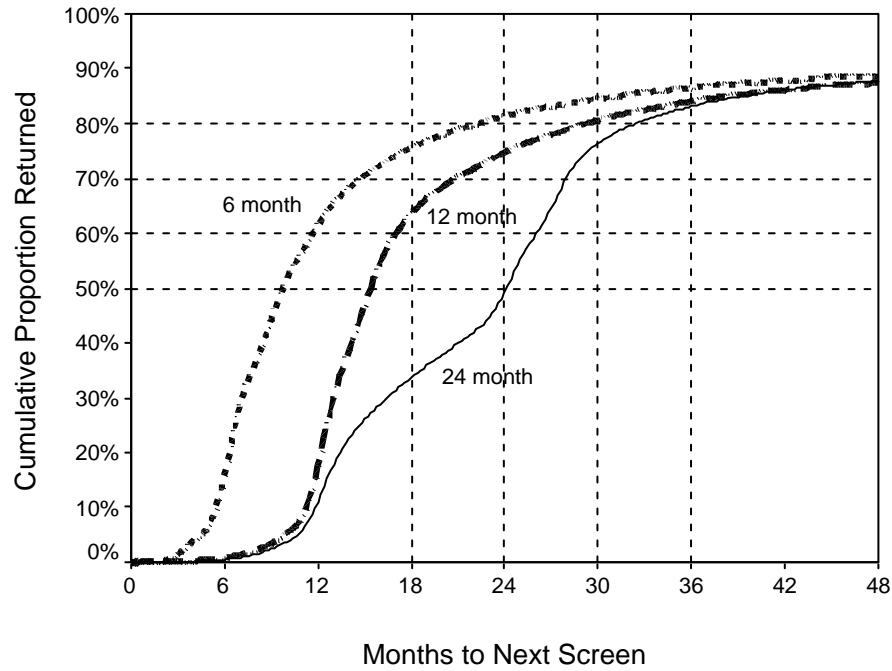
Patients with a cytological finding of moderate or higher atypia have a recommendation for further investigation. Thus, the rescreening rate was examined for patients with satisfactory smears and no finding of moderate or higher atypia.

Table V
Cumulative Numbers and Proportions Rescreened

Year of previous screen	1999	2000	2001
No. of patients	579,629	584,183	557,153
Rescreened			
by 18 months	54%	50%	54%
by 24 months	65%	62%	65%
by 30 months	76%	73%	76%
by 36 months	80%	77%	80%

*patients with unsatisfactory or moderate+ atypia smears were excluded.

Figure 3
Rescreening Rate for 2001 Patients by Recommended Interval



*Patients with unsatisfactory or moderate+ atypia smears were excluded

As of 2001, CCSP provides specific interval recommendations for most patients. Figure 3 shows the return rate by repeat interval recommendation. Patients with mild atypia were generally given a 6-month repeat recommendation.

Quality of Smears

The adequacy of a smear for interpretation is assessed as follows: satisfactory for interpretation, satisfactory but limited for interpretation, and unsatisfactory. The “unsatisfactory” category is used when the smear quality is inadequate for an interpretation. In general, the “satisfactory but limited” category is used when the smear quality is not ideal but still possible to interpret. In previous reportings of CCSP smear quality, “no endocervical cells” was considered “satisfactory but limited” for interpretation. It has been summarized in the “satisfactory” category since the 2003 report. The absence of endocervical, transformation zone component continues to be noted on the cytology report.

**Table VI
Smear Quality by Age Group: 2004**

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Cervical/Endo cervical Smears	27,502	121,374	145,912	143,672	91,160	40,225	6,933	576,778
Unsatisfactory (%)	305 (1.1)	1,338 (1.1)	1,537 (1.0)	1,104 (0.7)	1,102 (1.2)	707 (1.7)	144 (2.0)	6,237 (1.0)
Limited for Interpretation (%)	585 (2.1)	2,958 (2.4)	3,626 (2.4)	2,933 (2.0)	1,694 (1.8)	772 (1.9)	129 (1.8)	12,697 (2.2)

Table VI summarizes smear quality by 10-year age groups separately for cervical/endocervical smears.

The most commonly cited factor, for approximately 70% of smears of unsatisfactory quality, is scanty smear material. Scanty smear material is especially common in the older age groups. The next most cited reason is inflammatory exudate. Multiple factors may be cited.

The most commonly cited factor for smears which are limited for interpretation is inflammatory exudate, followed closely by scanty smear.

Cervical Smear Results

Results of the last cervical/endocervical smear of the year for each patient are summarized in Table VII. Whenever multiple atypia findings were reported on the same smear, the most severe finding was used.

Table VII
Distribution of Cytology Findings by Age Group Based on Patient's Last Cervical/Endocervical Smear in 2004

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients	25,331	110,942	134,456	135,883	87,141	38,892	6,664	539,309
Unsatisfactory (%)	210 (0.8)	951 (0.9)	1,025 (0.8)	716 (0.5)	728 (0.8)	482 (1.2)	115 (1.7)	4,227 (0.8)
Limited for interpretation (%)	434 (1.7)	2,184 (2.0)	2,851 (2.1)	2,283 (1.7)	1,392 (1.6)	686 (1.8)	104 (1.6)	9,934 (1.8)
Negative* (%)	21,015 (83.0)	92,899 (83.7)	116,222 (86.4)	116,052 (85.4)	78,409 (90.0)	36,025 (92.6)	6,125 (91.9)	466,747 (88.8)
“No endocervical cells “	576	2,943	3,818	4,496	520	3	.	12,356
Reactive changes (%)	758 (3.0)	3,118 (2.8)	3,881 (2.9)	5,098 (3.8)	2,749 (3.2)	852 (2.2)	150 (2.3)	16,606 (3.1)
Mild atypia (%)	1,941 (7.7)	6,805 (6.1)	5,315 (4.0)	6,315 (4.6)	2,931 (3.4)	694 (1.8)	113 (1.7)	24,114 (4.5)
<i>No significant atypia** in past 2 yrs</i>	1,522	4,776	3,780	4,312	1,929	488	78	16,885
<i>Significant atypia** in past 2 yrs</i>	419	2,029	1,535	2,003	1,002	206	35	7,229
Moderate or higher atypia (%)	397 (1.6)	2,042 (1.8)	1,344 (1.0)	923 (0.7)	412 (0.5)	150 (0.4)	57 (0.9)	5,325 (1.0)
<i>Mild atypia only in past 2 years</i>	289	1,371	910	618	268	116	47	3,619
<i>Moderate or higher atypia in past 2 years</i>	60	381	226	179	84	23	3	956
<i>No significant atypia** in past 2 yrs</i>	48	290	208	126	60	11	7	750

* include “no endocervical cells”

** significant atypia – mild or higher atypia

Table VIII
Significant Atypia Rates (per 1000) by Age Group
Based on Patient's Last Cervical/Endocervical Smear in 2004

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Number of Patients	25,331	110,942	134,456	135,883	87,141	38,892	6,664	539,309
Squamous:								
Mild (ASC-US/LSIL)	75.2	58.5	33.7	35.9	24.7	13.8	10.2	38.1
Moderate+ (HSIL)	15.4	17.7	8.9	5.2	3.0	1.7	3.6	8.5
Atypical (of unspecified significance)	0.5	0.4	0.4	0.4	1.4	2.0	4.9	0.7
Glandular:								
Mild	0.8	2.3	5.4	10.0	8.3	3.5	4.9	6.0
Moderate (High grade)	0.0	0.1	0.2	0.8	0.9	1.1	1.8	0.5
Marked+ (High grade)	0.0	0.0	0.0	0.1	0.2	0.4	1.3	0.1
Epithelial:								
Mild (Low grade)	0.4	0.4	0.3	0.4	0.4	0.4	1.8	0.4
Moderate+ (High grade)	0.1	0.4	0.7	0.5	0.4	0.4	1.8	0.5

ASC-US – atypical squamous cells of undetermined significance
 LSIL – low grade squamous intraepithelial lesion
 HSIL – high grade squamous intraepithelial lesion

Table VIII shows the significant atypia rates (per 1000 patients) by 10-year age group. Rates are presented by cell type and level of significance. Squamous cell type is the most common. Atypical squamous cells of undetermined significance / low-grade squamous intraepithelial lesion (ASC-US/LSIL) is more frequently reported in the younger women.

Follow-up of Abnormals

Follow-up Recommendation

The current CCSP practice is to follow mild atypia with repeat smear at 6-month intervals for up to two years. Patients with persistent mild atypia are then advised to have a colposcopy. Other procedures may be recommended on the basis of patient's clinical condition and cytology history.

Table IX
Follow-up Recommendation by Age Group
Based on Patients with Finding of Mild or Higher Atypia in 2004

	Age (years)							All Ages
	<20	20-29	30-39	40-49	50-59	60-69	70+	
Patients With Mild Atypia on Last Smear	1,941	6,805	5,315	6,315	2,931	694	113	24,114
Repeat in 6 months (%)	1,861 (95.8)	6,294 (92.4)	4,917 (92.5)	5,530 (87.5)	2,483 (84.7)	590 (85.0)	76 (67.2)	21,751 (90.2)
Other investigation* (%)	80 (4.1)	511 (7.5)	398 (7.4)	785 (12.4)	448 (15.2)	104 (14.9)	37 (32.7)	2,363 (9.7)
Patients with Moderate or Higher Atypia	397	2,042	1,344	923	412	150	57	5,325
Colposcopy and/or ECC (%)	353 (88.9)	1,942 (95.1)	1,268 (94.3)	800 (86.6)	282 (68.4)	78 (52.0)	22 (38.5)	4,745 (89.1)
Other investigation (%)	44 (11.0)	100 (4.8)	76 (5.6)	123 (13.3)	130 (31.5)	72 (48.0)	35 (61.4)	580 (10.8)

*The predominant recommendation was colposcopy investigation.

Table IX summarizes follow-up recommendations for patients with mild atypia and moderate or more severe atypia, based on the last smear of the year if the patient had more than one smear taken.

Compliance to Colposcopy Recommendations

The following figure presents age-specific compliance to colposcopy recommendations for patients with cervix/endocervix smears in 2003. Compliance is defined as having been achieved when a colposcopy examination was conducted within 1 week to 9 months of being recommended. Colposcopy examinations performed within one week of recommendation are not likely to be prompted by that recommendation.

Figure 4
Level of Compliance to Colposcopy Recommendation by Age Group
Patient's Last Cervical/Endocervical Smear in 2004

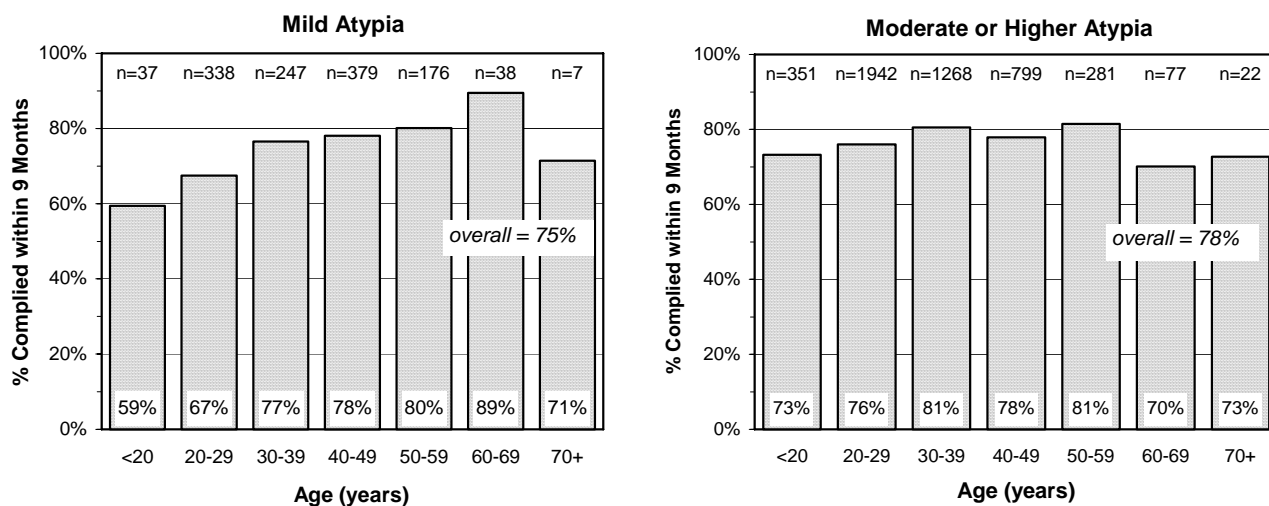


Figure 4 showed that the overall compliance to colposcopy recommendation for patients with findings of mild atypia and moderate or more severe atypia.

Positive Predictive Value of Cytology

The positive predictive value (PPV) of cytology was assessed by comparing significant cytology findings to histological diagnosis for patients with pathology specimens. Cytology findings were based on patient's last cervical/endocervical smear taken in 2003. Histological diagnosis was based on the most severe histological diagnosis from cervical pathology specimens taken up to one year after the Pap smear.

Table X below shows the number of patients with Pap smear finding of mild or higher squamous atypia and the PPV for patients with a histological diagnosis. Results are shown separately for patients with mild squamous atypia recommended to have a repeat smear, patients with mild squamous atypia recommended to have further investigation, and for patients with moderate or higher atypia.

Table X
Most Severe Histological Diagnosis within One Year of
Last Cervical/Endocervical Pap Smear of 2003

	Cytologic Finding					
	Mild Atypia				Moderate+ Atypia	
	Repeat Smear in 6 Months		Investigate			
	No.	%	No.	%	No.	%
Patients:	19,866	100.0	1,370	100.0	5,532	100.0
without pathology	18,678	94.0	429	31.3	792	14.3
with pathology	1,188	6.0	941	68.7	4,740	85.7
Positive Predictive Value <i>(patients with pathology):</i>						
CIN II or higher	293	24.7	161	17.1	2658	56.1
CIN III or higher	101	8.5	56	6.0	1503	31.7
Other Histology Finding:						
<i>Glandular</i>						
Severe	1	<0.1	-	-	2	<0.1
In situ	1	<0.1	-	-	5	0.1
Invasive	-	-	-	-	5	0.1
<i>Other invasive</i>	-	-	-	-	-	-

The PPV of cytological diagnosis for CIN II or higher on histology is 56.1% for moderate or higher atypia, and 17.1% for mild atypia that were referred for further investigation. Majority of patients with mild atypia cytology results were recommended to repeat smear in 6 months (93.5%). Some of these patients would have further indication, e.g. subsequent smear, to warrant colposcopy or other investigation within one year (6.0%). The PPV of these cases are 24.7%.

Provincial Colposcopy Program

The Provincial Colposcopy Program was developed to act in a complimentary manner to the Provincial Cervical Cancer Screening Program (CCSP). This service currently consists of 24 hospital-based clinics located throughout the province. Their locations and the community gynecologists who staff them are listed in the Appendix.

The majority of all diagnostic colposcopic examinations in the province are performed through regional, hospital-based clinics. Individuals who are affiliated with the provincial colposcopy program essentially confine their colposcopic practices to the hospital-based clinics. All participating individuals are certified, and use a uniform reporting system with standardized terminology. Their results are incorporated into the CCSP database, and are summarized for the annual continuing medical education workshop in colposcopy, held by the Provincial Colposcopy Program.

In 2004, 13,035 colposcopy examinations were provided. The majority of colposcopies are initiated as a result of abnormal cytology (see Figure 5) and the primary site of investigation is mainly cervix (see Figure 6).

Figure 5
Reason for Referral to Colposcopy Clinic: 2004

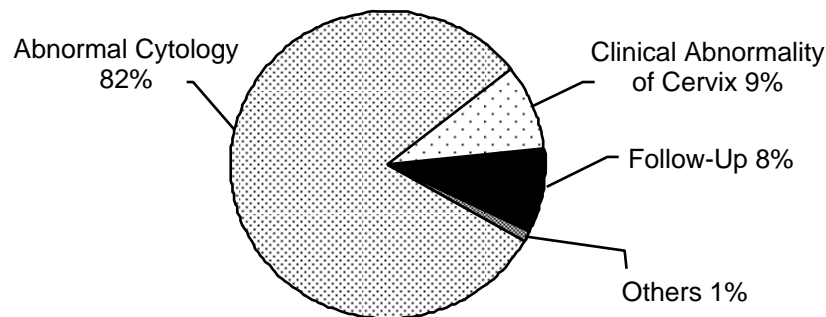
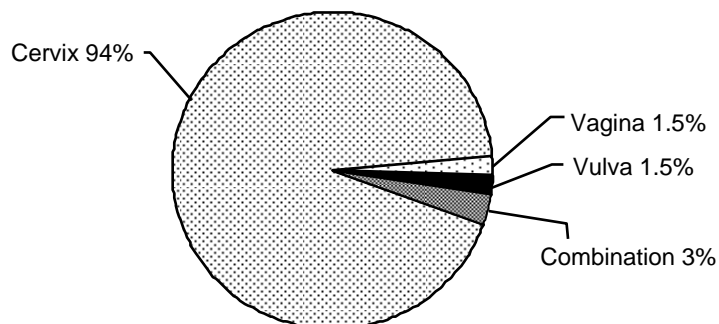


Figure 6
Site of Colposcopic Investigation: 2004



Results of all colposcopic examinations and suggested course of follow-up action are recorded on a standardized form. Copies of this form are sent to both the referring physician and to the CCSP for incorporation into the provincial database. This data collection process forms the basis of a provincial quality assurance program.

Cancer Statistics

New invasive cervical cancers diagnosed in 2001 to 2003 were identified from the British Columbia Cancer Registry and data collected by the CCSP. The cancer counts and incidence rates for 2001-2003 are presented in Table XI.

Table XI
Invasive Cervical Cancers by Age Group

		Age (Years)						Age 20+
		20-29	30-39	40-49	50-59	60-69	70+	
2003	Number of cases							
	All cell types	10	37	37	31	16	17	148
	Squamous cell only	7	27	26	16	11	11	98
	Incidence rate (<i>per 100,000</i>)							
	All cell types	3.6	11.7	10.5	11.2	9.2	7.3	9.1
	Squamous cell only	2.5	8.5	7.4	5.8	6.4	4.7	6.0
2002	Number of cases							
	All cell types	9	35	45	23	17	36	165
	Squamous cell only	6	26	31	16	15	27	121
	Incidence rate (<i>per 100,000</i>)							
	All cell types	3.3	10.8	13.0	8.7	10.1	15.7	10.3
	Squamous cell only	2.2	8.1	9.0	6.0	9.0	11.8	7.6
2001	Number of cases							
	All cell types	13	29	51	17	19	24	153
	Squamous cell only	12	21	40	12	9	21	115
	Incidence rate (<i>per 100,000</i>)							
	All cell types	4.8	8.9	15.0	6.7	11.6	10.7	9.7
	Squamous cell only	4.4	6.4	11.8	4.7	5.5	9.3	7.3

Notes:

1. Population estimates: BC STATS, BC Ministry of Finance and Corporate Relations
2. Population data was acquired through the Health Data Warehouse, BC Ministry of Health
3. Cancer data source: BC Cancer Registry and Cervical Cancer Screening Program of BC Cancer Agency

Invasive Squamous Carcinoma: 2003

Patient history review of invasive squamous cell carcinomas diagnosed in 2003 is summarized in Table XII. Patients who did not have a Pap smear within one to five years of being diagnosed with cervical cancer may have had their cancer prevented by screening. These patients fall into one of three categories. Never screened patients have no recorded CCSP Pap smears. Women last screened more than five years ago had discontinued screening. The Pap smear less than one year prior category comprises both women with cancer detected on first screen and women not screened within five years who had a Pap smear taken due to presenting with symptoms.

**Table XII
Screening History for Invasive Squamous Cell Cervical Cancer
Patients by Age Group: 2003**

	Age (years)						All Cancers
	20-29	30-39	40-49	50-59	60-69	70+	
No. of Invasive Squamous Cell Cancers	7	27	26	16	11	11	98
Never screened (%)	0	2 (7.4)	1 (3.9)	1 (6.3)	2 (18.2)	3 (27.3)	9 (9.2)
Last screened >5 years prior (%)	0	3 (11.1)	3 (11.5)	2 (12.5)	1 (9.1)	4 (36.3)	13 (13.2)
Pap smear <1 year prior (%) <i>(no screens in past 1-5 years)</i>	1 (14.3)	5 (18.5)	14 (53.8)	10 (62.5)	5 (45.4)	2 (18.2)	37 (37.8)
Screened 1-5 years prior (%)	6 (85.7)	17 (63.0)	8 (30.8)	3 (18.7)	3 (27.3)	2 (18.2)	39 (39.8)

Adenocarcinoma: 2003

Patient history review of invasive adenocarcinomas diagnosed in 2003 is summarized in Table XIII. Patients who did not have a Pap smear within one to five years of being diagnosed with cervical cancer fall into one of three categories. Never screened patients have no recorded CCSP Pap smears. Women last screened more than five years ago had discontinued screening. The Pap smear less than one year prior category comprises both women with cancer detected on first screen and women not screened within five years who had a Pap smear taken due to presenting with symptoms.

**Table XIII
Screening History for Invasive Adenocarcinoma Cervical Cancer
Patients by Age Group: 2003**

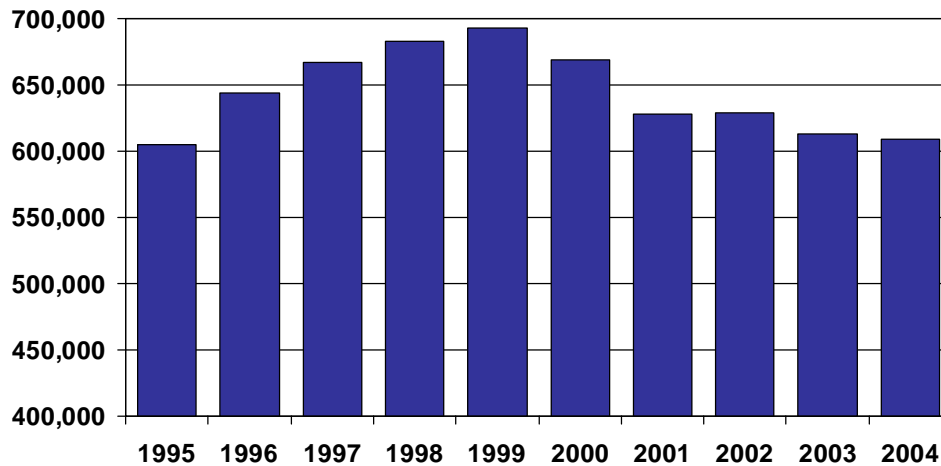
	Age (years)						All Cancers
	20-29	30-39	40-49	50-59	60-69	70+	
No. of Invasive Adenocarcinomas	3	8	10	15	3	5	44
Never screened (%)	.	.	1 (10.0)	1 (6.7)	.	.	2 (4.5)
Screened >5 years prior (%)	3 (60.0)	3 (6.8)
Pap smear <1 year prior (%)	.	.	2 (20.0)	2 (13.3)	3 (100)	2 (40.0)	9 (20.5)
Screened 1-5 years prior (%)	3 (100)	8 (100)	7 (70.0)	12 (80.0)	.	.	30 (68.2)

SPECIAL REPORT

10 Year Participation Pattern in Cervical Screening

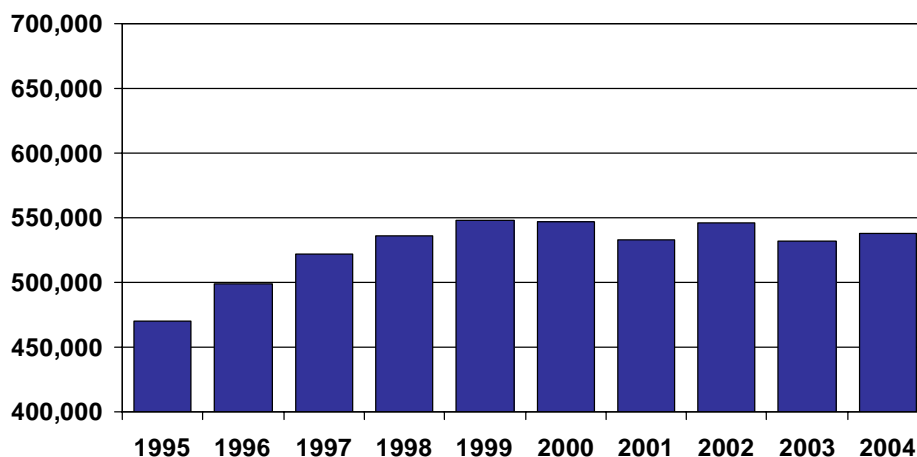
The number of Pap smear requisitions received by the CCSP has changed in recent years. Figure 7 below shows the number of requisitions received by the CCSP, by year in which the smear was taken. A steady increase in the number of smears from 1995 to 1999 is apparent. A peak of 692,872 smears was reached in 1999. 2000 and 2001 show a rapid descent from the peak. The number of smear requisitions received is relatively stable from 2002 onwards. In the most recent year shown, 2004, a total of 608,654 Pap smears were processed.

Figure 7
Number of Pap Smear Requisitions Received by CCSP by Year Smear Was Taken



Does the decline in number of smears from 1999 indicate that fewer women are being screened for cervical cancer in BC? To detect cervical cancer the smear needs to be from the cervix or endocervix. Figure 8 below shows the number of women with a cervical/endocervical Pap smear taken in BC from 1995 to 2004. The number of women has been increasing from 1995 to 1999, and has remained fairly steady at approximately 540,000 since 1999. The saw tooth pattern apparent from year 2001 onwards reflects recommendations being changed to biennial screening for women with an established history of negative Pap smear results.

Figure 8
Number of Women in BC Having Pap Smears from Cervix/Endocervix by Year Smear Was Taken



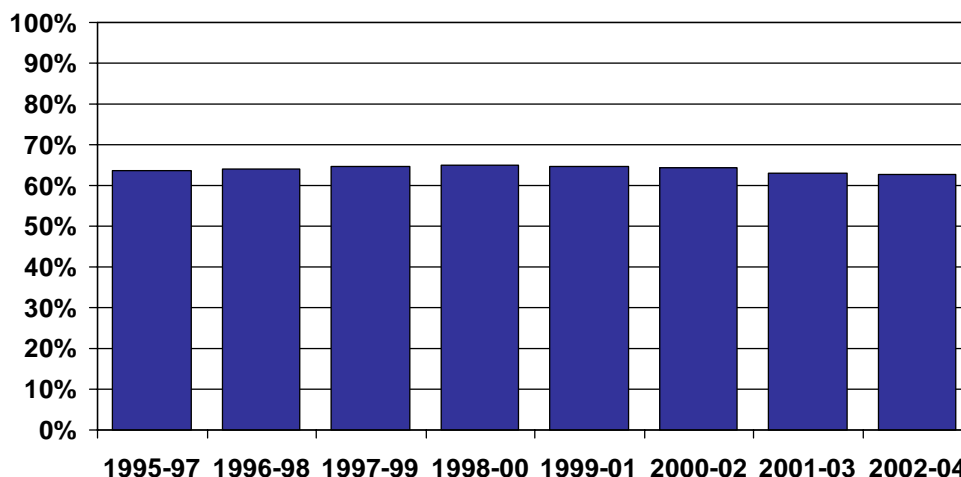
Further analysis showed the reduction in total number of Pap smear requisitions between 1995 and 2004 was attributable chiefly to three causes.

1. Reduction in smears with no cervical/endocervical component. Smear requisitions with smears without a(n) cervical/endocervical component declined from 8% in 1995 to 4% in 2004.
2. Reduction in smears from outside of BC. Smear requisitions from outside of BC declined from 5% in 1995 to 2% in 2004.
3. Reduction in women having multiple Pap smears per year. In 1995 10% of smear requisitions were from women with prior Pap smears in the same calendar year. By 2004 multiple annual requisitions comprised only 6% of requisitions.

Participation in cervical cancer screening should be based on the number of women having cervical Pap smears out of all women in the population who have a cervix. Women who underwent a total hysterectomy have no cervix. Unfortunately, annual statistics for the number of women with a cervix are not available. Our screening participation statistics are based on the entire female population of BC, which includes women not needing cervical cancer screening. The screening participation analysis will focus on women aged 20 to 69 years, this being the target age group for cervical cancer screening.

Figure 9 below shows participation in cervical screening for women in BC aged 20 to 69 years. Participation is defined as number of women who had a cervical/endocervical Pap smear in the given 36 month time period out of all women in BC of that age. Overall screening participation increased slightly from 64% in 1995-97 and 1996-98 to 65% in 1997-99 to 1999-01. There has been a small, gradual decline to 63% in the most recent years.

Figure 9
Participation in Screening by Women Aged 20-69 Years, Over 36 Month Time Periods



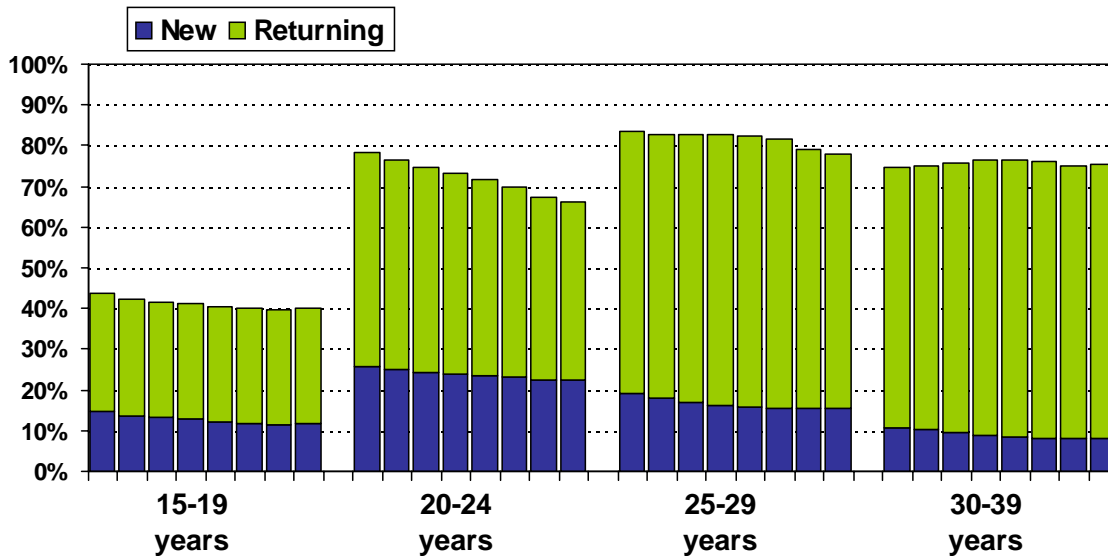
To gain further insight into the small overall participation decline, participation was examined by age groups. Age group separation revealed a steady drop over time in participation by women aged 20-29 years. Women in the 30-39, 40-49 and 50-59 year age groups had stable or slight increases in participation over time.

Participation was also examined by region as well as by age group. Patient’s residence data was not available, so the Health Service Delivery Area (HSDA) of the smear-takers practice was employed as a proxy. The entire province was partitioned into four regions, the regions being formed by grouping HSDAs. HSDA groupings were created in such a manner as to try to minimize cross-over between regions of patients and their health-care providers: Fraser Valley to Powell River, Vancouver Island, Southern Interior, Northern BC.

For each ten year age group, participation over time was compared between the four regions. Trends in participation by age groups were similar for three of the four regions. The North region was an exception. It showed a strong, steady increase in participation over time for all age groups except 20-29. In the 20-29 age group participation in the north remained stable, whereas this age group showed a steady decline in the other three regions.

Having established that only women aged 20-29 years had a declining participation trend, and that this trend was evident throughout the province, the next step was to examine the proportion of new and returning patients to see if the decline was due to decreasing recruitment or to delayed returns. For further insight the 20-29 year age group was partitioned into 20-24 and 25-29 year age groups. Age groups bordering this cohort, 15-19 and 30-39 years, were also examined. Figure 10 below shows trends in participation among these four age groups, by new and returning patients.

Figure 10
Participation in Screening by New and Returning Patients,
Over 36 Month Time Periods From 1995-1997 to 2002-04



Participation in screening for women aged 20-24 year shows a steady decline from 78% in 1995-97 to 66% in 2002-04. Participation for women aged 25-29 was stable from 1995-97 to 1999-97, then began to fall off slightly. The percentage of women new to screening is slowly declining for all four age groups. This indicates that the decrease in recruitment of women in their twenties is not due to screening beginning prior to age twenty nor to women delaying first screening until their thirties. There is a province-wide trend for younger women in BC failing to incorporate cervical cancer screening into their health care, and to keep disregarding it as they mature.

ACKNOWLEDGMENT

The Cervical Cancer Screening Program would like to thank its partners who have supported and contributed to the Program over the years.

The success of the Program depends on an integrated system of:

- Community health professionals taking the cervical smears (Pap smear slides)
- Dedicated and highly trained staff to process and read the slides
- Community facilities providing space and personnel to support regional colposcopy clinics
- Medical specialists to provide colposcopy follow-up and treatment

We would also like to thank the following organizations for their ongoing support:

- All hospitals participating in the Provincial Colposcopy Program
- BC Medical Association
- BC Ministry of Health
- BC Women's Health Centre
- Canadian Cancer Society
- College of Physicians and Surgeons
- Provincial Health Services Authority
- Women's Health Bureau

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1. Alkushi A, Abdul-Rahman ZH, Lim P, Schulzer M, Coldman A, Kalloger SE, Miller D, Gilks CB. Description of a novel system for grading of endometrial carcinoma and comparison with existing grading systems. *Am J Surg Pathol*. 2005 Mar;29(3):295-304
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9. Sun XR, Wang J, Garner D, and Palcic B. Detection of cervical cancer and high grade neoplastic lesions by a combination of liquid-based sampling preparation and DNA measurements using automated image cytometry. *Cell Oncol* 27(1): (2005) 33-41.
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Presentations:

1. Sun XR, Wang J, Garner D, and Palcic B. Detection of cervical cancer and high grade neoplastic lesions by a combination of liquid-based sampling preparation and DNA measurements using automated image cytometry. Presented at the 22nd International Papillomavirus Conference and Clinical Workshop in Vancouver, Canada. 30 April - 6 May, 2005.

SCREENING PROGRAM OVERVIEW

Definition of Screening

Primary prevention of cancer involves changes of behavior or habits that reduce a risk e.g. stop smoking, low fat diet etc. Screening for cancer is a secondary prevention strategy.

Secondary prevention can reduce cancer morbidity and mortality by diagnosing invasive disease at an earlier, more favorable prognostic stage and detecting precursor lesions associated with some cancers that once eliminated, prevent progression to invasive disease.

Screening is “the application of various tests to apparently healthy individuals to sort out those who probably have risk factors or are in the early stages of specified conditions.”¹

Limitations of Screening

The decision to screen an at-risk population for preclinical signs of cancer is based on well-established criteria related to the disease in question and the screening tests that re-used to identify individuals who may have occult disease.^{2,3,4} Although the overall objective of a screening program is to reduce morbidity and mortality from cancer, the goal of screening per se is the “application of a relatively simple, inexpensive test to a large number of persons in order to classify them as likely, or unlikely to have the cancer which is the object of the screen.” The emphasis on likelihood underscores the limits of what should be expected from screening (i.e screening tests are not diagnostic tests). A person with an abnormal screening test does not have a definitive diagnosis until additional, more sophisticated diagnostic tests are completed. The emphasis on likelihood also is important because screening tests are inherently limited in their accuracy, which varies by test, cancer site, and individual characteristics. Although most of screening interpretations are accurate, it is inevitable that some individuals are identified as possibly having cancer when they do not, and screening tests fail to identify some individuals who do have the disease.⁵ The comparative evaluation of accuracy versus error cannot be considered in absolute terms but rather should be evaluated in terms of the relative consequences on the other kind of error.

¹ Morrison A: Screening in Chronic Disease. New York, Oxford University Press. 1992.

² Cole P, Morrison AS: Basic issues in cancer screening. In Miller AB (ed); Screening in Cancer. Geneva, International Union Against Cancer, 1978, p7

³ Miller AB; Fundamentals of Screening. In Screening for Cancer. Orlando, Academic Press, 1985, p3

⁴ Wilson JMG, Junger G; Principles and Practice of Screening for Disease. Geneva, World Health Organization, 1968

⁵ Smith RA: Screening Fundamentals, Monogr Natl Cancer Inst 22:15, 1997

Organized Population Screening Program

To reduce morbidity and mortality from cancer in a population by screening, there must be coordinated and effective strategies to ensure acceptance and utilization of the established screening test. Since screening is targeted at asymptomatic women, the fine balance between maximizing benefits and minimizing undesirable effects must be maintained.

An organized approach to screening ensures that the target population has access to the screening service, and that it accepts and uses the services offered. This is achieved by including the following six program components:

1. Health Promotion
2. Professional Development/Education
3. Recruitment & Retention
4. Screening Test & Reporting
5. Follow-up
6. Evaluation/Research Partnerships

The success of screening is a shared responsibility of the team of individuals who work together to develop goals, set standards, monitor progress, and continue improvement in each of the six components.

Screening Program Administration

Population & Preventive Oncology of the BC Cancer Agency (BCCA), under the auspices of the Provincial Health Services Authority (PHSA), focuses on early detection and prevention of cancer, and the development and provision of cancer information. Its areas of responsibilities include:

1. Cancer Control Research (Epidemiology)
2. Surveillance and Outcomes Unit (Data and Evaluation)
3. Cancer Information Centre (Libraries)
4. Hereditary Cancer Program
5. Provincial Cancer Screening Programs

The Division of Population and Preventive Oncology is responsible for the administration of two population screening programs: the Cervical Cancer Screening Program (CCSP), and the Screening Mammography Program of BC (SMPBC). Data and Evaluation support for Screening Programs is provided by the Surveillance and Outcomes Unit.

CCSP SCREENING RECOMMENDATIONS

Criteria	Recommended Action
Onset of sexual activity or soon after	Start regular Pap smear screening
Negative or benign changes	Repeat smear in 12 months until there are 3 consecutive normal smears then continue at 24-month intervals
Mild atypia (dyskaryosis) squamous and/or glandular	Repeat in 6 months Colposcopy examination is recommended, if mild atypia persists for 2 years <i>*Recommendation for selected patient subgroup is under review</i>
Moderate or higher squamous or endocervical glandular atypia	Colposcopic examination is recommended
After age 69	Stop screening, if there are 3 or more normal smears in the last 10 years and no history of previous significant abnormality (moderate atypia or higher)
Pregnant Women	If no history of previous Pap smear, do Pap smear, otherwise follow guidelines as indicated in non-pregnant women
HIV Positive Women	Repeat smear in 6 months until there are 2 consecutive normal smears then continue at 12-month intervals

Post-Hysterectomy Screening Guidelines:

Screening of the vaginal vault is not necessary if the woman meets **all** of the following conditions:

- She has had a total hysterectomy (cervix removed) as opposed to a subtotal hysterectomy (cervix remains)
- The hysterectomy was performed for a benign condition and no significant dysplasia was found
- All previous Pap smears showed no significant abnormality (moderate atypia or higher)
- If no previous Pap smear record is available and hysterectomy pathology is benign, the patient should have two consecutive, negative smears one year apart before discontinuing screening.

Note: For women who had total hysterectomy (uterus and cervix completely excised) subsequent to a history of CIN II or III and no evidence of invasive carcinoma, routine vaginal screening can be discontinued after 3 consecutive, technically satisfactory smears over a three year period.

COLPOSCOPY CLINIC LOCATIONS AND PERSONNEL STAFFING

- 1/2. BCCA/VHHSC, Vancouver – Drs. T. Ehlen, D. Miller, L. Sadownik, M. Heywood and M. Plante
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4. Richmond General Hospital, Richmond – Dr. H. Mackoff, Dr. H. Robson
5. Lions Gate Hospital, North Vancouver – Drs. E. Hoyer, V. Scali and R. Goodall
6. Ridge Meadows Hospital, Maple Ridge – Dr. W. Yeung
7. Royal Columbian Hospital, New Westminster – Drs. D. Allan, J. Turner and S. Pedersen
8. Surrey Memorial Hospital, Surrey – Drs. G. Doersam and P. Yeung
9. Langley Memorial Hospital, Langley – Dr. E. Mah
10. Peace Arch Memorial Hospital, White Rock – Drs. G. Jackson and J. Christilaw
11. Powell River General Hospital – Dr. P. Goeritz
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15. St. Joseph’s General Hospital, Comox – Drs. D. Hartman and M. Bagdan
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18. Penticton Regional Hospital, Penticton – Dr. J. Henniger
19. Kelowna General Hospital, Kelowna – Drs. P. Wilson and M. Jones
20. Vernon Jubilee Hospital, Vernon – Dr. C. Hatfield
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23. Mills Memorial Hospital, Terrace – Dr. L. Almas
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25. MSA, Abbotsford – Dr. F. Ahman
26. Dawson Creek and District Hospital – **Non funded**
27. Prince George – **Non funded**
28. Whitehorse – Dr. W. MacNicol – **Non funded**

EDUCATIONAL MATERIAL

The following is a list of educational materials relating to the Cervical Cancer Screening Program and/or Pap smear screening.

For A General Audience

- Questions & Answers About Screening for Cancer of the Cervix (*available in English & Chinese*)
- Understanding Pap Smear Results

For Smear Takers

- Laminated Card: Technique for Obtaining Cervical Smears
- Video: Speculum Exam and Pap Smear
- An Office Manual for Health Professionals – “Screening for Cancer of the Cervix”

For Cantonese & Mandarin Speaking Women

- Video motivating this ‘hard-to reach’ group to have regular Pap smears
- Slide series for health care providers to use with colleagues or the Cantonese/Mandarin public
- Pamphlet about Pap smear screening recommendations

*The material above was developed in collaboration with the Fred Hutchinson Cancer Research Centre in Seattle

Continuing Medical Education

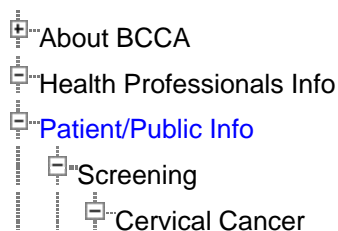
Continuing Medical Education (CME) rounds or workshops can be arranged for groups through the offices of the provincial program leaders of the Cervical Cancer Screening Program and/or the Colposcopy Program. Contact Lisa Kan, Screening Operations Leader, at 604-877-6201 or Email lkan@bccancer.bc.ca for more information.

Pilot Project Report

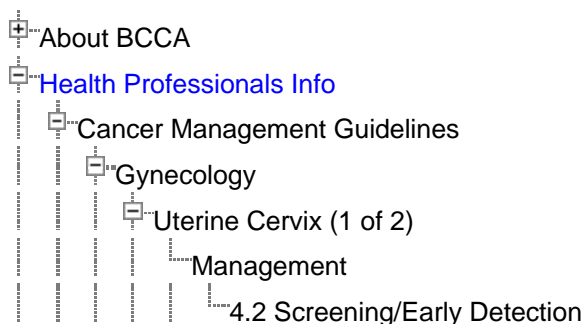
“Community Development Pilot Projects – Screening Programs and Health Authority Partnership”
This report describes the recent pilot project between the BC Cancer Agency and the Regional Health Authorities to work collaboratively to identify community mobilization strategies that will improve the participation rates in the Breast and Cervical Screening programs of women who are not part of the public health service delivery system, or who do not come for regular screening. A copy of the report is available free of charge by calling 604-877-6200.

Website: www.bccancer.bc.ca

Information for a general audience:



Information for smear takers:



REQUEST FOR EDUCATIONAL MATERIAL

Please call or fax this form to the CCSP to receive copies of the following free of charge:

Resources for a General Audience:

<u>Number of Copies</u>	<u>Description</u>
_____	Questions & Answers about Screening for Cancer of the Cervix – brochure (also available on website at www.bccancer.bc.ca/PPI/Screening/Cervical)
English	
_____	(available in English and Chinese)
Chinese	
_____	Understanding Pap Smear Results – brochure (available in English only)
_____	Motivational message for Cantonese & Mandarin speaking women to attend for screening – video (available with or without subtitles – produced in 2001)

Resources for Medical or Other Professionals:

<u>Number of Copies</u>	<u>Description</u>
_____	Technique for Obtaining Cervical Smears - laminated card
_____	Speculum Exam & Pap Smears – video (produced in 2000)
_____	Screening for Cancer of the Cervix - Office Manual for Health Professionals (available on website at www.bccancer.bc.ca/HPI/CancerManagementGuidelines/Gynecology/UterineCervix1of2/4Screening)
_____	Community Development Pilot Projects – Screening Programs and Health Authority Partnership – report

Your name: _____

Your address: _____

Your MSC #: _____

Return this form to: Cervical Cancer Screening Program
Material Requests
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Vancouver, BC V5Z 1G1
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Fax: 604-629-2510