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Technical Appendix (full)

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A. Data Sources

The following Data Sources were used for the analyses presented in this Atlas:

The Ontario Cancer Registry (OCR), Cancer Care Ontario

The OCR is a computerized database of information on all Ontario residents who have been newly-diagnosed with cancer or who have died of cancer. All cancers are included, with the exception of non-melanoma skin cancer and ductal carcinoma in situ (DCIS), a type of pre-invasive breast cancer.

The Discharge Abstract Database (DAD), Canadian Institute for Health Information

The DAD is a database of information abstracted from hospital records. It includes patient-level data for acute- and chronic-care hospitals, rehabilitation hospitals and day surgery clinics in Ontario.

The Ontario Health Insurance Plan (OHIP) database of physician billings

The OHIP database contains all claims made by Ontario physicians for insured services rendered to Ontario residents. Each record represents a separate service (identified by feecode) rendered to a specific person on a specific day. It includes the following information: type of service, diagnosis, who provided the service, who received it, service date, physician's practice group and referring physician (where applicable).

The Registered Persons Database (RPDB)

The Registered Persons Database (RPDB) is a population-based registry maintained by the Ministry of Health and Long-Term Care (MOHLTC) to manage publicly funded health care services covered under the Ontario Health Insurance Plan (OHIP). The RPDB is essentially a historical listing of the unique health numbers issued to each person eligible for Ontario health services. This listing includes corresponding demographic information such as date of birth, sex, address, date of death (where applicable) and changes in eligibility status. When new RPDB data arrive at ICES, personal information such as name and street address is removed, and each unique health number is converted into an anonymous identifier, ensuring the protection of each individual's privacy.

The ICES Physician Database (IPDB)

The IPDB is a database containing information about physicians practising in Ontario. It is created and maintained by ICES, using data from several sources. These sources include: the Ontario Physician Human Resource Data Centre (OPHRDC), the OHIP Corporate Provider Database; and the OHIP database of physician billings. The IPDB includes: demographic information about each physician (i.e., age, sex); his/her practice location; physician specialty; the types of service provided; where each physician was trained; and the year he/she graduated from medical school.

The Canadian Medical Directory (CMD)

The CMD is a proprietary database of information about physicians in Canada published by Scott's Directories Inc., in association with the Canadian Medical Association. Inclusion in the directory is voluntary.

2001 Census Area Profiles (Statistics Canada)

These Statistics Canada files contain population-based information from the 2001 census for different geographic areas (including census division and census metropolitan area). The files contain information on age, sex, ethnicity, educational level attained, employment, income and socioeconomic status.

Intercensal and postcensal population estimates (Statistics Canada)

Intercensal estimates use data from two different censuses (e.g., the 1991 census and the 1996 census) to calculate population estimates for the intervening years (e.g., 1992–1995). Postcensal estimates use data from a single census. Both these population estimates are adjusted using other data about births, deaths, migration and immigration.

B. Methods

I. Study populations and timelines

The study populations for each cancer site discussed in *Cancer Surgery in Ontario* included all Ontario residents 20 years of age or older who were newly-diagnosed with cancer between April 1, 2003 and March 31, 2004 inclusive.

Several look-back and look-forward "utilization windows" were used:

Purpose	Time window
To determine if an individual had surgery for their cancer	- from 12 months before to 12 months after their cancer diagnosis
To estimate the number of visits a person undergoing cancer-related surgery had with their treating surgeon	- from 6 months before to 6 months after their first surgery
To measure use of non-surgical health services by individuals who had cancer	- from 12 months before to 12 months after their definitive surgery
To measure use of non-surgical health services by individuals who did not have surgery	- from 12 months before to 12 months after their cancer diagnosis

II. Age grouping of study populations

Because certain cancers are known to affect a wider range of age groups than others, the choice of age groupings for each study population was based on the actual age range of that population. The age groups in each chapter of this Atlas are as follows:

Type of cancer	Age groups (years)
Breast	20–39, 40–49, 50–59, 60–69, 70+
Prostate	20–54, 55–64, 65–69, 70–74, 75+
Colon	20–54, 55–64, 65–69, 70–74, 75+
Rectal	20–54, 55–64, 65–69, 70–74, 75+
Lung	20–54, 55–64, 65–69, 70–74, 75+
Uterine	20–39, 40–49, 50–69, 70+
Ovarian	20–39, 40–49, 50–69, 70+
Cervical	20–39, 40–49, 50–69, 70+
Vulvar	20–49, 50+

III. Standardization method

All incidence rates were standardized to the 1991 population of Canada as of July 1, 1991 using the direct method of standardization. Sub-group proportions, such as the proportion of each particular cancer cohort who underwent surgery, were standardized to either the Overall Cancer Cohort or to the Cancer Surgery Cohort.

IV. Cancer definitions

Cancers were defined using the diagnosis code variable in the Ontario Cancer Registry (OCR). These are based on the International Classification of Disease, 9th revision (ICD-9) developed by the World Health Organization. The cancer sites studied in this Atlas were defined as follows:

Site	ICD-9 code
Female breast cancer	174
Prostate cancer	185
Colon cancer	153
Rectal cancer	154
Lung cancer	162
Uterine cancer	182
Ovarian cancer	183
Cervical cancer	180
Vulvar cancer	184.1, 184.2, 184.3, 184.4

V. Definition of patient residence

For all analyses presented in this Atlas, the definition of "Local Health Integration Network (LHIN) of patient residence" is based on where each person lived when he or she was diagnosed with cancer.

VI. Identification and categorization of cancer surgeries

Most analyses of cancer surgery begin with a set of predefined procedures; the next step is to examine who received each procedure. The current study differed in that we started with a number of cohorts (our study populations) who had been diagnosed with specific cancers during a given period. We then looked backward and forward in time to determine what types of procedures related to their cancer they received.

Below is a description of the entire multi-stage process:

Step 1. All individuals newly-diagnosed with cancer during the study period were identified from the OCR.

Step 2. Data on these individuals were then linked to the Canadian Institute for Health Information (CIHI) Discharge Abstract Database (DAD) to see what procedures they underwent during the time period from 12 months before to 12 months after their diagnosis.

Step 3. The list of procedures developed for each cancer site was reviewed by a group of experts to determine which were cancer-related. Five-digit codes contained in the Canadian Classification of Health Interventions (CCI)[1] were used to identify procedures associated with surgical cancer treatment (excluding biopsy).

Step 4. More detailed CCI codes (up to 10 digits) were used to define analytic surgical subgroups (i.e., definitive procedures).

(Note: "NEC" stands for "not elsewhere classified.")

[1] The CCI is the current national standard for classifying health care procedures. It replaces the Canadian Classification of Diagnostic, Therapeutic and Surgical Procedures (CCP) and the intervention portion of ICD-9-CM in Canada. CCI classifies a broad range of diagnostic, therapeutic and support interventions.

Breast Cancer

CCI codes for breast cancer surgical procedures

A. Breast-conserving surgery	
1YK87LA	Excision partial, nipple using open excisional approach
1YK89LA	Excision total, nipple using open approach
1YK90LAXXE	Excision total with reconstruction, nipple using open approach and local skin flap (e.g., propeller, star, quadripod skate)
1YL87LA	Excision partial, lactiferous duct using open approach
1YL89LA	Excision total, lactiferous duct using open approach
1YM87DA	Excision partial, breast using endoscopic approach with simple apposition
1YM87GB	Excision partial, breast using endoscopic guide wire (or needle hook) excision technique with simple apposition of tissue
1YM87LA	Excision partial, breast using open approach with simple apposition of tissue (e.g., suturing)
1YM87LAXXA	Excision partial, breast using open approach and full thickness autograft to close defect
1YM87UT	Excision partial, breast using open guide wire (or needle hook) excision technique and simple apposition of tissue
1YM88LAPM	Excision partial with reconstruction, breast without tissue with implantation of prosthesis
1YM88LAPME	Excision partial with reconstruction, breast with local flap with implantation of prosthesis
1YM88LAPMG	Excision partial with reconstruction, breast using distant pedicled flap with implantation of prosthesis
1YM88LATP	Excision partial with reconstruction, breast without tissue with implantation of tissue expander
1YM88LAXXE	Excision partial with reconstruction, breast using local flap with no implanted device
1YM88LAXXF	Excision partial with reconstruction, breast using free flap with no implanted device
1YM88LAXXG	Excision partial with reconstruction, breast using distant pedicled flap with no implanted device
B. Simple mastectomy without reconstruction	
1YM89LA	Excision total, breast without tissue repair

C. Simple mastectomy with reconstruction	
1YM89LAXXA	Excision total, breast with full thickness autograft
1YM90LAPM	Excision total with reconstruction, breast simple mastectomy with no node dissection without tissue with implantation of breast prosthesis
1YM90LAPME	Excision total with reconstruction, breast simple mastectomy with no node dissection using local flap with implantation of breast prosthesis
1YM90LAQF	Excision total with reconstruction, breast simple mastectomy with no node dissection without tissue with implantation of prosthesis and expander
1YM90LAQFE	Excision total with reconstruction, breast simple mastectomy with no node dissection using local flap with implantation of prosthesis and expander
1YM90LAQFF	Excision total with reconstruction, breast simple mastectomy with no node dissection using free flap (2) with implantation of prosthesis and expander
1YM90LATP	Excision total with reconstruction, breast simple mastectomy with no node dissection without tissue with implantation of tissue expander
1YM90LATPF	Excision total with reconstruction, breast simple mastectomy with no node dissection using free flap (2) with implantation of tissue expander
1YM90LATPG	Excision total with reconstruction, breast simple mastectomy with no node dissection using distant pedicled flap (1) with implantation of tissue expander
1YM90LAXXE	Excision total with reconstruction, breast simple mastectomy with no node dissection using local flap with no implanted device
1YM90LAXXF	Excision total with reconstruction, breast simple mastectomy with no node dissection using free flap (2) with no implanted device
1YM90LAXXG	Excision total with reconstruction, breast simple mastectomy with no node dissection using distant pedicled flap(1) with no implanted device
D. Radical mastectomy without reconstruction	
1YM91LA	Excision (modified) radical, breast without tissue
1YM91TR	Excision extended radical, breast without tissue
1YM91WP	Excision super radical, breast without tissue

E. Radical mastectomy with reconstruction	
1YM91LATP	Excision (modified) radical, breast with implantation of tissue expander
1YM91LAXXA	Excision radical (modified), breast using full thickness autograft
1YM91LAXXE	Excision (modified) radical, breast using local flap
1YM91TRXXA	Excision extended radical, breast using full thickness autograft
1YM91TRXXE	Excision extended radical, breast using local flap
1YM92LAPME	Excision (modified) radical with reconstruction, breast using local flap with implantation of breast prosthesis
1YM92LAPMF	Excision (modified) radical with reconstruction, breast using free flap with implantation of breast prosthesis
1YM92LAPMG	Excision (modified) radical with reconstruction, breast using distant pedicled flap with implantation of breast prosthesis
1YM92LAQFE	Excision (modified) radical with reconstruction, breast using local flap with implantation of prosthesis and expander
1YM92LAQFG	Excision (modified) radical with reconstruction, breast using distant pedicled flap with implantation of prosthesis and expander
1YM92LATPE	Excision (modified) radical with reconstruction, breast using local flap with implantation of tissue expander
1YM92LATPF	Excision (modified) radical with reconstruction, breast using free flap with implantation of tissue expander
1YM92LATPG	Excision (modified) radical with reconstruction, breast using distant pedicled flap with implantation of tissue expander
1YM92LAXXE	Excision (modified) radical with reconstruction, breast using local flap with no implanted device
1YM92LAXXF	Excision (modified) radical with reconstruction, breast using free flap with no implanted device
1YM92LAXXG	Excision (modified) radical with reconstruction, breast using distant pedicled flap with no implanted device
1YM92TRXXF	Excision extended radical with reconstruction, breast using free flap with no implanted device

F. Partial or total excision lymph nodes	
1MD87LA	Excision partial, lymph node(s), axillary using open approach
1MD89LA	Excision total, lymph node(s), axillary using open approach
1MD89LAXXA	Excision total, lymph node(s), axillary using open approach with full thickness graft
1MD89LAXXE	Excision total, lymph node(s), axillary using open approach with local flap
1MD89LAXXF	Excision total, lymph node(s), axillary using open approach with free distant flap

Definitive procedures for breast cancer

1. Mastectomy with lymph node excision (includes B, C, D or E plus F)
2. Mastectomy (includes B, C, D or E)
3. Breast-conserving surgery with lymph node excision (includes A plus F)
4. Breast-conserving surgery only (A only)
5. Other (some patients can have only lymph node excision) (F only)

Prostate Cancer

CCI codes for prostate cancer surgical procedures

A. Radical prostatectomy	
1QT91DA	Excision radical, prostate, using endoscopic (laparoscopic) approach
1QT91PB	Excision radical, prostate using open perineal approach
1QT91PK	Excision radical, prostate using open retropubic approach
B. Total/radical cystectomy (only for patients not registered in OCR with bladder cancer (ICD-9=188) within previous three years)	
1PM89LA	Excision total, bladder NEC with simple apposition (e.g., suturing or stapling) which does not involve creation of a cutaneous stoma
1PM90LAXXG	Excision total with reconstruction, bladder NEC using open approach with stoma formation and pedicled distant flap
1PM90RDXXG	Excision total with reconstruction, bladder NEC with creation of a continent rectal bladder to function without a stoma
1PM91LA	Excision radical, bladder NEC using open approach
1PM92LAXXG	Excision radical with reconstruction, bladder NEC with creation of continent urinary reservoir and permanent cutaneous stoma
1PM92RDXXG	Excision radical with reconstruction, bladder NEC with creation of a continent neobladder to function without a stoma

C. Open/endoscopic/percutaneous partial excision or destruction of prostate (including TURP, simple prostatectomy, cryosurgery)	
1QT59BAAD	Destruction, prostate endoscopic per orifice (transurethral) approach using cryosurgery
1QT59BAAG	Destruction, prostate endoscopic per orifice (transurethral) approach using laser
1QT59BAAW	Destruction, prostate endoscopic per orifice (transurethral) approach using radiofrequency
1QT59BAAZ	Destruction, prostate endoscopic per orifice (transurethral) approach using ultrasound ablation
1QT59BACG	Destruction, prostate endoscopic per orifice (transurethral) approach using microwave device (e.g., interstitial microwave thermoablation)
1QT59BAGX	Destruction, prostate endoscopic per orifice (transurethral) approach using device NEC
1QT59HAAD	Destruction, prostate, percutaneous (transperineal) approach using cryosurgery
1QT59HACG	Destruction, prostate percutaneous transperineal approach using microwave device (e.g., interstitial microwave thermoablation)
1QT87BA	Excision partial, prostate, endoscopic per orifice approach (TURP) using device NEC
1QT87BAAG	Excision partial, prostate endoscopic per orifice (transurethral) approach using laser NEC
1QT87BAAK	Excision partial, prostate endoscopic per orifice approach (transurethral) using loop electrode
1QT87PB	Excision partial, prostate open perineal approach using device NEC (e.g., digital dissection)
1QT87PK	Excision partial, prostate open retropubic approach using device NEC (e.g., digital dissection)
1QT87PNGX	Excision partial, prostate robotic assisted telemanipulation of tools using device NEC
1QT87QZ	Excision partial, prostate open transvesical approach using device NEC (e.g., digital dissection)
1QT87QZAG	Excision partial, prostate open transvesical approach using laser NEC

D. Total/radical orchidectomy	
1QM89DA	Excision total, testis, endoscopic (laparoscopic) inguinal approach without scrotal implant
1QM89DAPM	Excision total, testis, endoscopic (laparoscopic) inguinal approach without scrotal implant
1QM89LA	Excision total, testis, open scrotal approach without scrotal implant
1QM89LAPM	Excision total, testis, open scrotal approach with scrotal implant
1QM89WJ	Excision total, testis, open approach using special excisional technique without scrotal implant
1QM89WJPM	Excision total, testis, open approach using special excisional technique with scrotal implant
1QM91LB	Excision radical, testis using open abdominal approach
1QM91LBPM	Excision radical, testis using open abdominal approach with implantation of testicular prosthesis

E. Pelvic lymphadenectomy	
1MH87DA	Excision partial, lymph node(s), pelvic using endoscopic approach
1MH87LA	Excision partial, lymph node(s), pelvic using open approach
1MH89DA	Excision total, lymph node(s), pelvic using endoscopic approach
1MH89LA	Excision total, lymph node(s), pelvic using open approach

Definitive procedures for prostate cancer

1. Radical prostatectomy (includes A and B); where appropriate)
2. Non-curative prostate surgery (includes C, D, E; only if no radical prostatectomy on the same day)

Colorectal Cancer (cancers of the colon, rectum)

CCI codes for colorectal cancer surgical procedures

A. Resection of colon without stoma, with anastomosis	
1NK87DN	Excision partial, small intestine endoscopic (laparoscopic) approach; Enterocolostomy anastomosis technique
1NK87DP	Excision partial, small intestine endoscopic (laparoscopic) approach; Enteroenterostomy anastomosis technique
1NM87DE	Excision partial, large intestine endoscopic (laparoscopic) approach; Colorectal anastomosis technique
1NM87DF	Excision partial, large intestine endoscopic (laparoscopic) approach; Colocolostomy anastomosis technique
1NM87DN	Excision partial, large intestine endoscopic (laparoscopic) approach; Enterocolostomy anastomosis technique
1NM89DF	Excision total, large intestine endoscopic (laparoscopic) approach; Ileorectal (endorectal, ileoproctostomy) anastomosis technique
1NM91DF	Excision radical, large intestine endoscopic (laparoscopic) approach; Colocolostomy anastomosis technique
1NQ87DF	Excision partial, rectum endoscopic (laparoscopic) approach; Colorectal anastomosis technique
1NQ89GV	Excision total, rectum combined endoscopic (abdominal) with perineal approach; Coloanal (or ileoanal) anastomosis technique
1NK87RE	Excision partial, small intestine open approach; Enterocolostomy anastomosis technique
1NM87RD	Excision partial, large intestine open approach; Colorectal anastomosis technique
1NM87RE	Excision partial, large intestine open approach; Enterocolostomy anastomosis technique
1NM87RN	Excision partial, large intestine open approach; Colocolostomy anastomosis technique
1NM89RN	Excision total, large intestine open approach; Ileorectal (endorectal, ileoproctostomy) anastomosis technique
1NM91RD	Excision radical, large intestine open approach; Colorectal anastomosis technique
1NM91RE	Excision radical, large intestine open approach; Enterocolostomy anastomosis technique
1NM91RN	Excision radical, large intestine open approach; Colocolostomy anastomosis technique

A. Resection of colon without stoma, with anastomosis (cont'd)	
1NQ87PB	Excision partial, rectum perineal (e.g., pull through, transanal, sacral or sphincteric) approach; Colorectal anastomosis technique
1NQ87RD	Excision partial, rectum open abdominal approach (e.g., anterior); stoma formation with distal closure
1NQ89KZ	Excision total, rectum abdominoperineal approach; Coloanal (or ileoanal) anastomosis technique
1NQ89SF	Excision total, rectum abdominal (anterior) approach; Coloanal (or ileoanal) anastomosis technique
1NQ90LAXXG	Excision total with reconstruction, rectum using open approach with ileum (for construction of pouch)
B. Resection of colon without stoma, without anastomosis	
1NK87DA	Excision partial, small intestine endoscopic (laparoscopic) approach; Simple excisional technique
1NK87LA	Excision partial, small intestine open approach; Simple excisional technique
1NM87DA	Excision partial, large intestine endoscopic (laparoscopic) approach; Simple excisional technique
1NM87LA	Excision partial, large intestine open approach; Simple excisional technique
C. Local excision – colon	
1NQ87DA	Excision partial, rectum endoscopic (laparoscopic) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NQ87LA	Excision partial, rectum open abdominal (e.g., anterior) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NQ87CA	Excision partial, rectum perineal (e.g., pull through, transanal, sacral or sphincteric) approach closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NQ87PF	Excision partial, rectum posterior (e.g., entering through incision between coccyx and anal verge with proctotomy) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NT87LA	Excision partial, anus using excisional technique
D. Local excision – rectum	
1NQ87DA	Excision partial, rectum endoscopic (laparoscopic) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NQ87LA	Excision partial, rectum open abdominal (e.g., anterior) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NQ87CA	Excision partial, rectum perineal (e.g., pull through, transanal, sacral or sphincteric) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NQ87PF	Excision partial, rectum posterior (e.g., entering through incision between coccyx and anal verge with proctotomy) approach; closure by apposition technique (e.g., suturing, stapling) or no closure required (for tissue regeneration)
1NT87LA	Excision partial, anus using excisional technique

E. Resection with permanent stoma	
1NQ89LH	Excision total, rectum abdominoperineal approach; Stoma formation with distal closure
1NQ89LHXXG	Excision total, rectum abdominoperineal approach; Continent ileostomy formation
1NQ89RS	Excision total, rectum abdominal (anterior) approach; Stoma formation with distal closure
1NQ89RSXXG	Excision total, rectum abdominal (anterior) approach; Continent ileostomy formation

F. Resection with potentially reversible stoma	
1NM87DX	Excision partial, large intestine endoscopic (laparoscopic) approach; Stoma formation and distal closure
1NM87DY	Excision partial, large intestine endoscopic (laparoscopic) approach; Stoma formation with creation of mucous fistula
1NM91DX	Excision radical, large intestine endoscopic (laparoscopic) approach; Stoma formation with distal closure
1NQ87DX	Excision partial, rectum endoscopic (laparoscopic) approach; stoma formation with distal closure
1NK87TF	Excision partial, small intestine open approach; Stoma formation with distal closure
1NK87TG	Excision partial, small intestine open approach; Stoma formation with mucous fistula
1NM87TF	Excision partial, large intestine open approach; Stoma formation with distal closure
1NM87TG	Excision partial, large intestine open approach; Stoma formation with creation of mucous fistula
1NM89TF	Excision partial, large intestine open approach; Stoma formation with distal closure
1NQ87TF	Excision partial, rectum open abdominal approach (e.g., anterior) stoma formation with distal closure

G. Bypass	
1NK76DN	Bypass, small intestine endoscopic (laparoscopic) approach; Enterocolostomy bypass technique
1NK76DP	Bypass, small intestine endoscopic (laparoscopic) approach; Enteroenterostomy bypass technique
1NM76DN	Bypass, large intestine endoscopic (laparoscopic) approach using diversionary enterocolostomy
1NK76RE	Bypass, small intestine open approach; Enterocolostomy bypass technique
1NK76RF	Bypass, small intestine open approach; Enteroenterostomy bypass technique
1NK76RJ	Bypass, small intestine open approach; Gastroenterostomy bypass technique
1NM76RE	Bypass, large intestine open approach using diversionary enterocolostomy
1NM76RN	Bypass, large intestine open approach using diversionary colocolostomy
1NK87RF	Excision partial, small intestine open approach; Enteroenterostomy anastomosis technique

H. Stoma	
1NK77EN	Bypass with exteriorization, small intestine endoscopic (laparoscopic) approach end enterostomy (e.g., terminal, end or loop ileostomy)
1NK77RR	Bypass with exteriorization, small intestine open approach end enterostomy (e.g., terminal, end or loop ileostomy)
1NM77EP	Bypass with exteriorization, large intestine colostomy using endoscopic (laparoscopic) approach
1NM77RS	Bypass with exteriorization, large intestine colostomy using open approach

I. Stoma "indicators"	
1NK82EN	Reattachment, small intestine endoscopic (laparoscopic) approach of ileostomy
1NK82RE	Reattachment, small intestine open approach of enterocolostomy (diversionary)
1NK82RR	Reattachment, small intestine open approach of ileostomy
1NK82DP	Reattachment, small intestine endoscopic (laparoscopic) approach of enteroenterostomy (diversionary)
1NK82RF	Reattachment, small intestine open approach of enteroenterostomy (diversionary)
1NM82EP	Reattachment, large intestine endoscopic (laparoscopic) approach of colostomy (may involve: reanastomosis of colon to (Hartmann) rectal stump or mucous fistula)
1NM82RN	Reattachment, large intestine open approach of diversionary colocolostomy
1NM82RS	Reattachment, large intestine open approach of colostomy (may involve: reanastomosis of colon to (Hartmann) rectal stump or mucous fistula)
1NM82DF	Reattachment, large intestine endoscopic (laparoscopic) approach of diversionary colocolostomy

Definitive procedures for colorectal cancers

1. Resection with permanent stoma (includes E)
2. Resection with potentially reversible stoma (includes F or A plus H or I within 12 months)
3. Resection without stoma (includes A where no H or I within 12 months)
4. Bypass, stoma, local excision or other abdominal procedure (includes G, H, B, C or D only)

Lung Cancer

CCI codes for lung cancer surgical procedures

A. Biopsy	
1MC87LA	Excision partial, lymph node(s), neck region NEC (cervical) using open approach with no tissue
2GT71HA	Biopsy, lung using percutaneous (needle) approach
2GV71DA	Biopsy, pleura using endoscopic approach (VATS)
2GV71HA	Biopsy, pleura using percutaneous (needle) approach
2GW71HA	Biopsy, mediastinum using percutaneous (needle) approach
2MB71HA	Biopsy, deep cervical lymph nodes using percutaneous (needle) approach
2MC71HA	Biopsy, lymph nodes of neck region using percutaneous (needle) approach
2MC71LA	Biopsy, lymph nodes of neck region using open approach
2MD71HA	Biopsy, axillary lymph nodes using percutaneous (needle) approach
2ME71HA	Biopsy, mediastinal lymph nodes using percutaneous (needle) approach
2MF71HA	Biopsy, intrathoracic lymph nodes using percutaneous (needle) approach
2OA71HA	Biopsy, liver using percutaneous (needle) approach
2PB71HA	Biopsy, adrenal gland using percutaneous (needle) approach
2SL71HA	Biopsy, ribs using percutaneous (needle) approach
2SZ71HA	Biopsy, soft tissue of the chest and abdomen using percutaneous (needle) approach

B. Surgical staging (including mediastinoscopy)	
2GX71DA	Biopsy, diaphragm using endoscopic approach
1ME89DA	Excision total, lymph node(s), mediastinal using endoscopic approach
2GV70LA	Inspection, pleura using open approach
2GX71LA	Biopsy, diaphragm using open approach
2GM71LA	Biopsy, bronchus using open approach
1ME89LA	Excision total, lymph node(s), mediastinal using open approach
2GV71LA	Biopsy, pleura using open approach
2MB71LA	Biopsy, deep cervical lymph nodes using open approach
2GV70DA	Inspection, pleura using endoscopic approach (VATS)
2GT71DA	Biopsy, lung using endoscopic approach (VATS)
2GY70LA	Inspection, thoracic cavity using open approach
2GY70DA	Inspection, thoracic cavity using endoscopic approach (VATS)
2GT71LA	Biopsy, lung using open approach
1ME87DA	Excision partial, lymph node(s), mediastinal using endoscopic approach
1MF87LA	Excision partial, lymph node(s), intrathoracic NEC using open approach
1ME87LA	Excision partial, lymph node(s), mediastinal using open approach
2GW71LA	Biopsy, mediastinum using open approach
2GT70LA	Inspection, lung using open approach
2GW70LA	Inspection, mediastinum using open approach
2MF71LA	Biopsy, intrathoracic lymph nodes using open approach
2GW71DA	Biopsy, mediastinum using endoscopic approach (VATS)
2GW70DA	Inspection, mediastinum using endoscopic approach (VATS)
2ME71LA	Biopsy, mediastinal lymph nodes using open approach
2ME71DA	Biopsy, mediastinal lymph nodes using endoscopic approach

C. Palliative procedures	
1GM59BAAG	Destruction, bronchus NEC using endoscopic per orifice approach and laser
1GM59BAGX	Destruction, bronchus NEC using endoscopic per orifice approach and device NEC
1GT52DA	Drainage, lung NEC using endoscopic approach (VATS)
1GT59DAAG	Destruction, lung NEC using endoscopic approach (VATS) and laser
1GT59DAGX	Destruction, lung NEC using endoscopic approach (VATS) and device NEC
1GV52DA	Drainage, pleura using endoscopic approach (VATS)
1GV52DATS	Drainage, pleura using endoscopic approach and leaving drainage tube in situ
1GV52HA	Drainage, pleura using percutaneous (needle) approach
1GV52HAHE	Drainage, pleura using percutaneous catheter (intracostal) with underwater seal drainage system
1GV52HATK	Drainage, pleura using percutaneous catheter with suction pump, (under water seal or negative pressure)
1GV52LA	Drainage, pleura using open approach
1GV52LATS	Drainage, pleura using open approach and leaving drainage tube in situ
1GV52LAXXE	Drainage, pleura using open approach and skin flaps
1GV59DAGX	Destruction, pleura using endoscopic approach (VATS) and device NEC
1GV59DAZ9	Destruction, pleura using endoscopic approach and chemical agent NEC
1GV59HAZ9	Destruction, pleura using percutaneous instillation of chemical agent NEC (e.g., talc)
1GV59LAGX	Destruction, pleura using open approach and device NEC
1GV87DA	Excision partial, pleura using endoscopic approach (VATS)
1GV87LA	Excision partial, pleura using open approach
1HA52DA	Drainage, pericardium using endoscopic approach (VATS)
1HA52HA	Drainage, pericardium using percutaneous (needle) approach
1HA52HATS	Drainage, pericardium using percutaneous (needle) approach leaving drainage tube (catheter) in situ
1HA52QA	Drainage, pericardium using subxiphoid approach
1HA52QB	Drainage, pericardium using thoracic approach (e.g., sternotomy, thoracotomy)

D. Sublobar resection	
1GR87QB	Excision partial, lobe of lung using open thoracic approach
1GR87DA	Excision partial, lobe of lung using endoscopic approach (VATS)
1GR87NW	Excision partial, lobe of lung using intrapericardial (transpericardial) approach
E. Lobar resection	
1GR89QB	Excision total, lobe of lung using open thoracic approach
1GR91QB	Excision radical, lobe of lung with simple closure open thoracic approach
1GR89DA	Excision total, lobe of lung using endoscopic approach (VATS)
1GR89NW	Excision total, lobe of lung using intrapericardial (transpericardial) approach
1GT87QB	Excision partial, lung NEC using open thoracic approach
1GR91NWXXF	Excision radical, lobe of lung using free flap open intrapericardial (transpericardial) approach
1GT87NW	Excision partial, lung NEC using intrapericardial (transpericardial) approach
1GT87DA	Excision partial, lung NEC using endoscopic approach (VATS)
F. Pneumonectomy	
1GT89QB	Excision total, lung NEC using open thoracic approach
1GT91QB	Excision radical, lung NEC with simple closure open thoracic approach
1GT89NW	Excision total, lung NEC using intrapericardial (trans-pericardial) approach
1GT89DA	Excision total, lung NEC using endoscopic approach (VATS)
1GT91NW	Excision radical, lung NEC using simple closure open intrapericardial (transpericardial) approach

Note: Surgeries described in Exhibits 5.1, 5.2 and 5.3 include all of the above (B-F) except biopsy.

Definitive procedures for lung cancer

1. Pneumonectomy (includes F)
2. Lobar resection (includes E)
3. Sublobar resection (includes D)
4. Palliative procedures (includes C)
5. Surgical staging (includes B)
6. Biopsy (includes A)

Gynecological cancers (uterine, ovarian, cervical and vulvar)

CCI codes for gynecological cancer surgical procedures

A. Unilateral or bilateral salpingo-oophorectomy (USO/BSO)	
1RB89DA	Excision total, ovary NEC using endoscopic (laparoscopic) approach
1RB89LA	Excision total, ovary NEC using open approach
1RB89RA	Excision total, ovary NEC using open vaginal approach
1RD89DA	Excision total, ovary with fallopian tube using endoscopic (laparoscopic) approach
1RD89LA	Excision total, ovary with fallopian tube using open approach
1RD89RA	Excision total, ovary with fallopian tube using open vaginal approach
B. Total hysterectomy (TAH)	
1RM89AA	Excision total, uterus and surrounding structures using combined laparoscopic and vaginal approach
1RM89CA	Excision total, uterus and surrounding structures using vaginal approach
1RM89DA	Excision total, uterus and surrounding structures using endoscopic (laparoscopic) approach
1RM89LA	Excision total, uterus and surrounding structures using open approach
C. Radical hysterectomy	
1RM91CA	Excision radical, uterus and surrounding structures using vaginal approach (e.g., Schauta operation)
1RM91LA	Excision radical, uterus and surrounding structures using abdominal approach (e.g., Wertheim operation)
D. Cervicectomy	
1RN89CA	Excision total, cervix NEC per orifice (vaginal) approach; without tissue
1RN89LA	Excision total, cervix NEC open approach; without tissue
E. Omentectomy	
1OT87DA	Excision partial, abdominal cavity using endoscopic (laparoscopic) approach
1OT87LA	Excision partial, abdominal cavity using open approach

F. Cone procedure	
1RM59BAAK	Destruction, uterus and surrounding structures endoscopic per orifice approach using loop electrode (LEEP)
1RN59CAAG	Destruction, cervix NEC using per orifice approach and laser NEC
1RN59CAAN	Destruction, cervix NEC using per orifice approach (vaginal) and electrocoagulation device
1RN87BAAC	Excision partial, cervix NEC using endoscopic per orifice approach and cold knife
1RN87BAAK	Excision partial, cervix NEC using endoscopic per orifice approach and loop electrode (LEEP)
1RN87BAGX	Excision partial, cervix NEC using endoscopic per orifice approach and device NEC
1RN87CAAC	Excision partial, cervix NEC using per orifice (vaginal) approach and cold knife
1RN87CAAG	Excision partial, cervix NEC using per orifice (vaginal) approach and laser
1RN87CAAK	Excision partial, cervix NEC using per orifice (vaginal) approach and loop electrode
1RN87CAGX	Excision partial, cervix NEC using per orifice (vaginal) approach and device NEC
G. Vulva procedures	
1RW87LA	Excision partial, vulva NEC using open approach and no tissue
1RW88LAXXA	Excision partial with reconstruction, vulva NEC using open approach with full thickness graft
1RW88LAXXE	Excision partial with reconstruction, vulva NEC using open approach and local flap
1RW91LA	Excision radical, vulva NEC without tissue repair
1RW91LAXXF	Excision radical, vulva NEC; Vulvectomy, radical using free distant flap (e.g., myocutaneous or fasciocutaneous)
1RY87LA	Excision partial, perineum using open approach
H. Groin node excision	
1MJ87	Excision partial, lymph node(s), inguinal
1MJ89	Excision total, lymph node(s), inguinal
1MJ91	Excision radical, lymph node(s), inguinal
OHIP R912	Lymph Nodes - Ileoinguinal, radical resection
OHIP R913	Lymph Nodes - Axill/inguinal nodes - radical resection
OHIP R914	Lymph Nodes - Axill/inguinal nodes - ltd resection

I. Pelvic lymph node excision	
1MH87	Excision partial, lymph node(s), pelvic
1MH89	Excision total, lymph node(s), pelvic
OHIP S776	Staging pelvic node lymphadenectomy for carcinoma (laparoscopic or open)
H. Para-aortic node excision	
1MG87	Excision partial, lymph node(s), intraabdominal
1MG89	Excision total, lymph node(s), intraabdominal

Definitive procedures for gynecological cancers

Uterine cancer

1. TAH and USO/BSO with lymph node excision (must have B, A and I, with or without H)
2. TAH and USO/BSO (includes B plus A)
3. TAH only (includes B only)
4. Other (includes any other surgical procedures)

Ovarian cancer

1. USO/BSO with lymph node excision (includes A plus I, with or without B)
2. USO/BSO and omentectomy (includes A plus E, with or without B)
3. USO/BSO (includes A, with or without B)
4. Other (includes any other surgical procedures)

Cervical cancer

1. Radical hysterectomy (includes C)
2. Total hysterectomy or cervicectomy with or without pelvic or PA node excision (includes B with or without I and H)
3. Cone procedure (includes F)
4. Other (includes any other surgical procedures)

Vulvar cancer

1. Vulva procedure and groin node excision within three months (includes G plus H)
2. Vulva procedure only, groin node excision only or other (includes G only, H only or any other surgical procedure)

VII. Identification of diagnostic, radiologic and other non-surgical health services

OHIP feecodes were used to identify the procedures* listed below:

- AUS/urethral sling/bulking agents
- Barium enema
- Biopsy–non-surgical
- Biopsy–surgical
- Bladder declotting
- Bone scan
- Brachytherapy
- Bronchoscopy
- Chemotherapy
- Chest tube
- Cold knife cone
- CT scan
- Cytoscopy
- Dilatation and curettage (D&C)
- Emergency department visits
- Endoscopy
- External beam radiation
- Groin fine needle aspiration
- Home care visits
- Hormone injection
- Intensive care unit (ICU) days
- LEEP/Laser
- Lower GI endoscopy
- Mammography
- Mediastinoscopy
- Mediastinotomy
- MRI scan
- Pap smear
- Paracentesis
- Pleurodesis
- Radiation therapy planning
- Specialist consultations
- Stoma reversal (using CCI codes from CIHI-DAD)
- Surgeon visits
- Thoracentesis
- Thoroscopy
- Ultrasound
- Ureteric stent insertion
- Urethral catheterization
- Visual internal urethrotomy (VIU)
- Wire localization procedures
- X-ray

* Utilization of these procedures was examined in Exhibits X.7 and X.8.

AUS/urethral sling/bulking agents	
S548	Rep - Urethral sling
S559	Rep - Kauffman Type proc for incontinence
S560	Rep - following prev perineum oper for incont.
E791 (with cysto – Z606/607)	Bladder - Diagnostic - periurethral injection of collagen or PTFE - Urog. Urin. Sx. Proc.
Barium enema (double or single contrast)	
X112	DIAG. RAD. Colon - barium enema incl. survey films
X113	DIAG. RAD. Colon - air contrast, primary/secondary, incl. survey films
Biopsy–Non-surgical	
Non-surgical biopsy–Breast	
J149	DIAG. US. Ultrasonic guide biopsy/asp./amniocentesis/ drainage etc.
R107	Breast – Exc. Tumour/tissue biopsy/treatment etc.
X121	Stereotactic Core Breast Biopsy
Z139	Breast – Aspiration cyst – one/more (I.O.P.)
Z141	Breast – Needle biopsy – one/more
E542	Excision lesion when performed outside hospital
Non-surgical biopsy–Prostate	
J149	DIAG. US. Ultrasonic guide biopsy/asp./amniocentesis/ drainage etc.
Z712	Prostate - Inc - Biopsy, needle
Non-surgical biopsy–Lung or pleura, percutaneous	
Z340	Lungs & Pleura - Inc - biopsy lung, needle
Z336	Lungs & Pleura - Inc - biopsy lung, needle
X168	DIAG. RAD. X-ray CTT guidance of biopsy
Non-surgical biopsy–Uterus	
Z581	Corpus uteri – inc/exc office endometrial curettage
Z719	Corpus uteri – biopsy/endometrial/suction of curette
Z770	Corpus uteri – inc/exc endometrial sampling
Non-surgical biopsy–Ovary	
J149	DIAG. US. Ultrasonic guide biopsy/asp./amniocentesis/ drainage etc.
X168	DIAG. RAD. X-ray CTT guidance of biopsy
Non-surgical biopsy–Cervix	
Z720	Cervix uteri – Exc – w/out fulgarization
Z731	Cervix uteri – Invest abnormal cytology – colposcopic tech.
Non-surgical biopsy–Vulva	
Z475	Vulva & Introitus exc – biopsy(s) – sole proc – gen anes.
Z477	Vulva & Introitus exc – biopsy(s) – sole proc – local anaes.
Z736	Surg exc/electrodesicc/CO2 laser – local anaes.

Biopsy–Surgical (using CIHI-DAD data)	
Surgical biopsy–Breast	
2MD71 **(2002+)**	Biopsy, axillary lymph nodes
2YK71 **(2002+)**	Biopsy, nipple
2YL71 **(2002+)**	Biopsy, lactiferous duct
2YM71 **(2002+)**	Biopsy, breast NOS
97.8 **(up to 2002)**	Invasive diagnostic procedures on breast
97.82 **(up to 2002)**	Other biopsy of breast
Surgical biopsy–Colon or rectum (laparotomy/laparoscopy, GI tract or abdominal cavity)	
2NF71DA	Biopsy, stomach using endoscopic (laparoscopic) approach
2NF71LA	Biopsy, stomach using open approach
2NK71DA	Biopsy, small intestine using endoscopic (laparoscopic) approach
2NK71LA	Biopsy, small intestine using open approach
2NM71DA	Biopsy, large intestine using endoscopic (laparoscopic) approach
2NM71LA	Biopsy, large intestine using open approach
2NQ71LA	Biopsy, rectum using open approach
2OA71DA	Biopsy, liver using endoscopic (laparoscopic) approach
2OA71LA	Biopsy, liver using open approach
2OT71DA	Biopsy, abdominal cavity using endoscopic (laparoscopic) approach
2OT71LA	Biopsy, abdominal cavity using open approach
Surgical biopsy–Uterus	
2RS71	Biopsy, vagina
2RJ71	Biopsy, uterine ligaments
2RM71	Biopsy, uterus and surrounding structures
2OT71	Biopsy, abdominal cavity
Surgical biopsy–Ovary	
2RN71	Biopsy, cervix
2RF71	Biopsy, fallopian tube
2OT71	Biopsy, abdominal cavity
Surgical biopsy–Cervix	
2RN71	Biopsy, cervix
Surgical biopsy–Vulva	
2RW71	Biopsy, vulva

Bladder declotting	
E783	With secondary surgical evacuation bladder clots
Bone scan	
J650	NUCL. MED. Bone scintigraphy – gen survey
J651	NUCL. MED. Bone Single site
J850	NUCL. MED. Bone scintigraphy – gen survey
J851	NUCL. MED. Bone Single site
Y650	NUCL. MED. Bone scintigraphy – gen survey
Y651	NUCL. MED. Bone Single site
Y850	NUCL. MED. Bone scintigraphy – gen survey
Y851	NUCL. MED. Bone Single site
Brachytherapy	
S640	Brachytherapy - Stereotactic prostate brachytherapy
X324	Radium (sealed sources) - Interstitial.
X313 and J138 on the same day	X313: Radiotherapy - Radiation Treatment Planning, Level 4 - Full 3D Treatment Preparation
	J138: DIAG. US. Pelvic Intracavit-e.x. transrectal transvag vulation induct.
Brachytherapy w/without radiation therapy	
X322	Radium (sealed sources) treatment planning dosage
X323	Radium (sealed sources) Intracavit. applic. - 1st applic.
X324	Radium (sealed sources) - Interstitial
X325	Radium (sealed sources) Applic. plaque/mould
X334	Radium (sealed sources) Intracavit. applic. - rep. applic.
with or without	
X310 - X313	Radiation therapy planning
X305	Intracavitory contact X-ray therapy - first application
X306	Intracavitory contact X-ray therapy - repeat application
Bronchoscopy	
Z327	Trachea & Bronchi - Bronchoscopy - with/out biopsy
Z330	Chest Wall & Mediastinum - Endoscop - Mediastinoscopy
Z333	Chest Wall & Mediastinum - Endoscop - Mediastinoscopy
Z342	Limited bronchoscopy with placement of blocker
Z348	Chest Wall & Mediastinum - Mediastinoscopy w/Bronchoscopy
Z359	Bronchoscopy Rep for tracheal bronchial toilet
Chemotherapy	
G339	Inj/inf.chemotherapy & pt.assess.single agent I.V.
G345	Inj/inf.chemotherapy & pt assess.multip.agent I.V.
G359	Inj/inf.chemotherapy& pt assess.sp.singleagent etc.
G381	Inj/inf.chemotherapy (marrow suppress.) single inj.

Chest tube	
Z341	Lungs & Pleura - CI drain effusion/pneumothorax
Cold knife cone	
S744	Cervix Uteri - Knife Conization w/without Diag curettage
CT scan	
CT scan-Thorax (chest, breast)	
X125	CTT – thorax – with/out I.V. contrast
X406	CTT – thorax – without I.V. contrast
X407	CTT – thorax – with I.V. contrast
CT scan-Abdomen	
X126	Abdomen – with/out I.V. contrast
X409	Abdomen – without I.V. contrast
X410	Abdomen – with I.V. contrast
CT scan-Pelvis	
X231	Pelvis – without I.V. contrast
X232	Pelvis – with I.V. contrast
X233	Pelvis – with/out I.V. contrast
CT scan-Head	
X400	CTT - head - without I.V. contrast
X401	CTT - head - with I.V. contrast
X402	CTT - complex head - without I.V. contrast (see also preamble)
X405	CTT - complex head - with I.V. contrast
X408	CTT - complex head - with/out I.V. contrast
X188	CTT - head - with/out I.V. contrast
Cytoscopy	
Z606	Bladder - Cystoscopy - diagn w/without urethroscopy
Z607	Bladder - Cystoscopy - repeat within 30 days
Dilatation and curettage (D&C)	
Z583	Corpus Uteri - Endoscopy - hysteroscopy w/without biopsy/D&C
Z725	Cervix Uteri - Dilatation & Cautery - gen anaes
Emergency department visits	
Any emergency department (ED) record in the National Ambulatory Care Reporting System	
Endoscopy	
Z560	Intestines - Endoscopy - Duodenoscopy (not with Z399/Z400)
Z580	Endoscopy (using 60cm. flex scope)
External beam radiation only	
X310 - X313	Radiation therapy planning

Groin fine needle aspiration (FNA)	
Z118	Skin - Aspiration superficial lump/cytology
Z405	Lymph Nodes - Biopsy - ant cervical, axillary, inguinal
Home care visits	
Any record in the Ontario Home Care Adminstrative System (OHCAS)	
Hormone injections	
G342	Endocrinology - Implantation of hormone pellets
G372	Inj/inf.intramusc/subcut/intraderm. with visit
Intensive care unit (ICU) days (any of the following; limit of one per day)	
G400	Critical care per diem (first day)
G401	Critical care per diem (2nd to 10th day)
G402	Critical care per diem (11th day onward)
G405	Ventilatory support – ICU (first day)
G406	Ventilatory support – ICU (2nd to 10th day)
G407	Ventilatory support – ICU (11th day onward)
G557	Comprehensive care – ICU (first day)
G558	Comprehensive care – ICU (2nd to 10th day)
G559	Comprehensive care – ICU (11th day onward)
LEEP/Laser	
Z729	Cervix Uteri - Cryo/Electroconiz or C02 laser - w/out Curettage
Z766	Conization lop Electrosurgical excision procedure
Lower GI endoscopy	
Z555	Endoscopy - sigmoid/descending colon (flexible sigmoidoscopy)
S155	Colonsocopy w/laparotomy
Z555 w/ one or more of E740, E741, E747, E705	Endoscopy - sigmoid/descending colon
	Intestine - Endo/Colonoscopy/ to splenic/ hepatic colon or caecum, add to Z555
Z555 only	Endoscopy - sigmoid/descending colon (flexible sigmoidoscopy)
Z580	Endoscopy (using 60cm. flex scope)
Z535	Rectum - Sigmoidoscopy w/out anoscopy (not with Z555/Z580)
Mammography	
X184	DIAG. RAD. Mammogram – dedicated equipment – unilateral
X185	DIAG. RAD. Mammogram – dedicated equipment – bilateral
X186	DIAG. RAD. Mammogram – dedicated equip. or xeroradiography – unilater
X187	DIAG. RAD. Mammogram – dedicated equip. or xeroradiography – bilateral

Mammography (additional view)	
X194	DIAG. RAD. Additional coned magnification views limit 2/film Mammog.
Mediastinoscopy	
Z328	Lungs and Pleura endoscopy with mediastinotomy
Z329	Chest Wall & Mediastinum - Endoscopies - Mediastinoscopy
Z330	Chest Wall & Mediastinum - Endoscop - Mediastinoscopy
Z333	Chest Wall & Mediastinum - Endoscop - Mediastinoscopy
Z348	Chest Wall & Mediastinum - Mediastinoscopy w/Bronchoscopy
Mediastinotomy	
Z328	Lungs and Pleura endoscopy with mediastinotomy
Z348	Chest Wall & Mediastinum - Mediastinotomy w/Bronchoscopy
Z347	Chest Wall & Mediastinum - Ant Mediastinotomy - sole proc.
MRI scan	
MRI scan-Thorax (chest, breast)	
X441	Mag. Res. Im. – thorax – multislice S.E. (1 or 2 echos)
MRI scan–Abdomen/pelvis	
X451	Mag. Res. Im. – abdomen – multislice S.E. (1 or 2 echos)
X461	Mag. Res. Im. – pelvis – multislice S.E. (1 or 2 echos)
Pap smear	
E340	Gynecology - papanicolaou smear - out of hospital - Diag. & Theru. Procedure
G365	Gynaec. Periodic Papanicolaou smear
G394	Additonal papanicolaou smear for follow up
Q001	Preventive Care Management-Biannually for Pap Smears Age 35-70
Paracentesis	
Z590	Abd/Perit/Oment - Paracentesis - Asp for diagnostic sample
Z591	Abd/Perit/Oment - Paracentesis therapeut drain sample
Z763	Abd/Perit/Oment - Paracentesis with lavage
Pleurodesis	
E606	Lungs & Pleura - chemotherapy/scleros agent, add to Z332/Z341
Z339	Lungs & Pleura - Intercostal drain/sclerosing agent

Radiation therapy planning (used as a proxy measure for radiation therapy)	
X310	Radiotherapy - Radiation Treatment Planning - Level 1 - Simple Treatment Planning
X311	Radiotherapy - Radiation Treatment Planning - Level 2 - Intermediate Treatment Planning
X312	Radiotherapy - Radiation Treatment Planning - Level 3 - Complex Treatment Planning
X313	Radiotherapy - Radiation Treatment Planning - Level 4 - Full 3D Treatment Preparation
Specialist consultations	
Consultations–Radiation oncology	
A345	Consult. - Rad. Oncol.
A346	Re-Consult. - Rad. Oncol.
A745	Ltd. Consult - Rad. Oncol.
C345	Consult. - Rad. Oncol. - Hosp.
C346	Re-Consult. - Rad. Oncol. - Hosp.
C745	Ltd. Consult. - Rad. Oncol. - Hosp.
Consultations–Medical oncology	
A135	Consult. - Int. & Occ. Med.
A136	Re-Consult. - Int. & Occ. Med.A435
A435	Limited Consult. - Int. Med.
C135	Consult. - Int. Med. - Hosp.
C136	Re-Consult. - Int. Med. - Hosp.
C435	Limited Consult. - Int. Med. - Hosp.
Stoma reversal (using CCI codes from CIHI-DAD)	
1NK82EN	Reattachment, small intestine endoscopic (laparoscopic) approach of ileostomy
1NK82RE	Reattachment, small intestine open approach of enterocolostomy (diversionary)
1NK82RR	Reattachment, small intestine open approach of ileostomy
1NK82DP	Reattachment, small intestine endoscopic (laparoscopic) approach of enteroenterostomy (diversionary)
1NK82RF	Reattachment, small intestine open approach of enteroenterostomy (diversionary)
1NM82EP	Reattachment, large intestine endoscopic (laparoscopic) approach of colostomy (may involve: reanastomosis of colon to (Hartmann) rectal stump or mucous fistula)
1NM82RN	Reattachment, large intestine open approach of diversionary colocolostomy
1NM82RS	Reattachment, large intestine open approach of colostomy (may involve: reanastomosis of colon to (Hartmann) rectal stump or mucous fistula)
1NM82DF	Reattachment, large intestine endoscopic (laparoscopic) approach of diversionary colocolostomy

Surgeon visits (includes assessments, consultations and counselling)	
Visits–General surgery	
A033	Spec. Assess. - Gen. Surg.
A034	Partial-Assess. - Gen. Surg.
A035	Consult. - Gen. Surg.
A036	Repeat-Consult. - Gen. Surg.
A935	Special Surgical Consultation on I.C. basis
C033	Spec. Assess. - Gen. Surg. - Hosp.
C034	Spec. Re-Assess. - Gen. Surg. - Hosp.
C035	Consult. - Gen. Surg. - Hosp.
C036	Re-Consult. - Gen. Surg. - Hosp.
C935	Special surgical consult. - Cardio & Thor.Surg. - Hosp.
K013	Counselling - Individual care - first three units
K033	Counselling one person additional units/pat/year/unit
K040	Group Counselling two or more persons
K041	Group Counselling two or more persons additional
Visits–Urology	
A353	Spec. Assess. – Urol.
A354	Partial-Assess. -Urol.
A355	Consult. -Urol.
A356	Repeat-Consult. -Urol.
A935	Special Surgical Consultation on I.C. basis
C353	Spec. Assess. -Urol. - Hosp.
C354	Spec. Re-Assess. -Urol. - Hosp.
C355	Consult. -Urol. - Hosp.
C356	Re-Consult. -Urol. - Hosp.
C935	Special surgical consult. - Hosp.
K013	Counselling - Individual care - first three units
K033	Counselling one person additional units/pat/year/unit
K040	Group Counselling two or more persons
K041	Group Counselling two or more persons additional

Surgeon visits (includes assessments, consultations and counselling) (cont'd)	
Visits–Thoracic or cardiothoracic surgery	
A093	Spec. Assess. - Cardio. & Thorac. Surg.
A094	Partial - Assess. - Cardio. & Thorac. Surg.
A095	Consult. - Cardio. & Thorac. Surg.
A096	Repeat - Consult. - Cardio. & Thorac. Surg.
A643	Spec. Assess. - Thorac. Surg.
A644	Partial - Assess. - Thorac. Surg.
A645	Consult. - Thorac. Surg.
A646	Repeat - Consult. - Thorac. Surg.
A935	Special Surgical Consultation on I.C. basis
C093	Spec. Assess. - Cardio & Thorac. Surg. - Hosp.
C094	Spec. Re-Assess. - Cardio & Thorac. Surg. - Hosp.
C095	Consult. - Cardio & Thorac. Surg. - Hosp.
C096	Re-Consult. - Thorac. Surg. - Hosp.
C643	Spec. Assess. - CThorac. Surg. - Hosp.
C644	Spec. Re-Assess. - Thorac. Surg. - Hosp.
C645	Consult. - Thorac. Surg. - Hosp.
C646	Re-Consult. - Thorac. Surg. - Hosp.
C935	Special surgical consult. - Hosp
K013	Counselling - Individual care - first three units
K033	Counselling one person additional units/pat/year/unit
K040	Group Counselling two or more persons
K041	Group Counselling two or more persons additional
Visits–Obstetrics and gynecology	
A203	Spec. Assess. - Obs. & Gyn.
A204	Partial-Assess. - Obs. & Gyn.
A205	Consult. - Obs. & Gyn.
A206	Repeat-Consult. - Obs. & Gyn.
A935	Special Surgical Consultation on I.C. basis
C203	Spec. Assess. - Obs. & Gyn. - Hosp.
C204	Spec. Re-Assess. - Obs. & Gyn. - Hosp.
C205	Consult. - Obs. & Gyn. - Hosp.
C206	Re-Consult. - Obs. & Gyn. - Hosp.
C935	Special surgical consult. - Cardio & Thor.Surg. - Hosp
K013	Counselling - Individual care - first three units
K033	Counselling one person additional units/pat/year/unit
K040	Group Counselling two or more persons
K041	Group Counselling two or more persons additional

Surgeon visits (includes assessments, consultations and counselling) (cont'd)	
Visits–Gynecologic oncology	
A203	Spec. Assess. - Obs. & Gyn.
A204	Partial-Assess. - Obs. & Gyn.
A205	Consult. - Obs. & Gyn.
A206	Repeat-Consult. - Obs. & Gyn.
A935	Special Surgical Consultation on I.C. basis
C203	Spec. Assess. - Obs. & Gyn. - Hosp.
C204	Spec. Re-Assess. - Obs. & Gyn. - Hosp.
C205	Consult. - Obs. & Gyn. - Hosp.
C206	Re-Consult. - Obs. & Gyn. - Hosp.
C935	Special surgical consult. - Cardio & Thor.Surg. - Hosp
K013	Counselling - Individual care - first three units
K033	Counselling one person additional units/pat/year/unit
K040	Group Counselling two or more persons
K041	Group Counselling two or more persons additional
Thoroscopy	
Z335	Lungs & Pleura - Thoracoscopy (pleuroscopy) w/out pleural
Thoracentesis	
Z331	Lungs & Pleura - Asp diagnostic sample
Z332	Lungs & Pleura -Asp therapeutic drain with/out diagn sample
Ultrasound	
Ultrasound–Abdomen	
J128	DIAG. US. Abdomen/Retroperitoneum – Abdom. scan ltd. study
J428	DIAG. US. Abdomen/Retroperitoneum – Abdom. scan ltd. study
J135	DIAG. US. Abdomen/Retroperitoneum – Abdom. scan, complete
J435	DIAG. US. Abdomen/Retroperitoneum – Abdom. scan, complete
Ultrasound–Breast/axilla	
J127	DIAG. US. Breast – scan B-mode 52
J427	DIAG. US. Breast – scan B-mode 52
J125	DIAG. US. Thorax – chest masses, pleural effusion – A & B-mode
J425	DIAG. US. Thorax – chest masses, pleural effusion – A & B-mode
J182	DIAG. US. Extremities – per limb excl. vasc. study

Ultrasound (cont'd)	
Ultrasound–Pelvis	
J162	DIAG. US. Pelvis – pelvic, complete
J462	DIAG. US. Pelvis – pelvic, complete
J163	DIAG. US. Pelvis – pelvis limited study not for pregnancy
J463	DIAG. US. Pelvis – pelvis limited study not for pregnancy
For uterine and ovarian cancers include the following additional procedures:	
J164	DIAG. US. Pelvis – Follicle monitoring studies
J464	DIAG. US. Pelvis – Follicle monitoring studies
Ultrasound–Transrectal, transvaginal	
J138	DIAG. US. Pelvi intracavit. – e.x. transrectal transvag vulation induct. (excluding those with X313 on same day)
J438	DIAG. US. Intracavitary – e.x. transrectal transvaginal
J161	DIAG. US. Intracavitary – limited for other than pregnancy
J461	DIAG. US. Intracavitary – limited for other than pregnancy
For uterine and ovarian cancers include the following additional procedures:	
J165	DIAG. US. Pelvis – transvaginal sonohysterography
J476	DIAG. US. Transvaginal sonohysterography
Ureteric stent insertion	
E773	With placement of ureteric stent
Urethral catheterization	
E775	With catheterization of ureters with/ without hydrodistention
Z602	Bladder - catheterization - office etc.
Z603	Bladder - catheterization - home etc.
Z611	Bladder - catheterization - hospital etc.
Visual internal urethrotomy (VIU)	
S532	Inc - urethrotomy - transurethral (visual)
Z615	Urethra - Manipulation - Filiform and follower urethral dilation under general anesthetic, and may include bladder catheterization
Z621	Manip - Dilation stricture, male - local anaes.

Wire localization procedures	
J004	Cl.proc.with X-ray Intramamm. needling/localiz. under mammogr. control
E525	Add'l fee when excision performed after mammogr. wire localization
X-ray–Chest	
X090	DIAG. RAD. Chest - single film
X091	DIAG. RAD. Chest - two views
X092	DIAG. RAD. Chest - three or more views

VIII. Identification of physician specialties and sub-specialties

Identifying physician specialties and sub-specialties presented several challenges.

- The fact that the physician identifiers used in the CIHI-DAD are not standard across all Ontario hospitals made it necessary to use OHIP data for the physician specialty analysis. The OHIP billings then had to be matched back to the procedures identified in the CIHI-DAD, a challenging process because the procedures are not defined the same way in the two data sources.

- There is variation in the feecodes which physicians use to bill OHIP for surgical procedures (i.e., they do not always bill as one might expect).

- Some physician sub-specialties are not listed in the OHIP data, so it was necessary to link to other sources. Each additional data source used increases the potential sources of misclassification error.

- Because the OHIP fee schedule does not follow the same structure as the CIHI-DAD, it was necessary to use an iterative process to identify and match billings with surgeries.

Description of process used to identify physician specialties/sub-specialties

1. A list of OHIP billing codes used for cancer surgery was developed by the clinician/authors involved in each Atlas chapter.

2. For each cancer site, all OHIP records were extracted that matched the following criteria: the service date was between April 1, 2002 and March 31, 2005; the patient was a member of the cancer cohort; the feecode was one of those on the list provided by the clinician/authors.

3. OHIP billings were matched with the CIHI-DAD procedures on patient and date. This was done twice: first, we sought an exact match between the procedure date on the DAD record and the service date on the OHIP billing; then we utilized a date window of +/-2 days.

4. In situations where there was still a high proportion of unmatched surgeries, the process was started over, using a slightly different methodology. Rather than extracting OHIP billings using a defined list of feecodes, we extracted all OHIP billings for services other than office/emergency department or long-term care visits for the patient cohort within the defined time frame.

5. After going through the matching exercise outlined in #3 (above), the matched OHIP billings were examined to see what other feecodes might have been missed in the original list of probable billing codes.

6. After consultation with the clinician/authors, the original list of feecodes was amended, and the initial process was re-run, resulting in the final match.

For the definitive surgeries, match rates ranged from a low of 82.8 percent for vulvar cancer to a high of 96.0 percent for breast cancer. Below is a list of the OHIP feecodes used to identify surgery for different cancers.

Once the OHIP billings for the surgeries were identified, the specialty of the physician who submitted the billing was obtained from the ICES Physician Database. This data was then linked to the Canadian Medical Dictionary to check for any self-reported sub-specialties.

Type of Cancer	OHIP Feecodes Extracted
Breast	R105, R107, R108, R109, R111, R117, R913, R914, E525, E546, E505, Z139, Z141
Prostate	S645, S646, S647, S648, S649, S650, S651, S652, S653, S654, S655, Z712
Colon	S149, S154, S156, S157, S158, S160, S162, S164, S165, S166, S167, S168, S169, S170, S171, S172, S173, S176, S180, S185, S188, S213, S214, S215, S217, S312, Z750
Rectal	S149, S154, S156, S157, S158, S160, S162, S164, S165, S166, S167, S168, S169, S170, S171, S172, S173, S176, S180, S185, S188, S213, 214, S215, S217, S249, S312, Z750, Z754, Z784, Z785
Lung	M142, M143, M144, M145, M111, M135, M137, Z328, Z329, Z330, Z331, Z332, Z333, Z335, Z337, Z339, Z341, Z347, Z348, Z357
Gynecological cancers (uterine, ovarian, cervical, vulvar)	R912, R913, S213, S312, S704, S705, S710, S714, S738, S744, S745, S750, S754, S757, S758, S759, S762, S763, S764, S765, S766, S767, S776, S781, S782, S810, Z553, Z563, Z583, Z720, Z723, Z729, Z730, Z731, Z735, Z766, Z769 (Note: A combined extraction was done for the gynecological cancers because of overlap in procedures and billing)