

# **PCSI 2024**

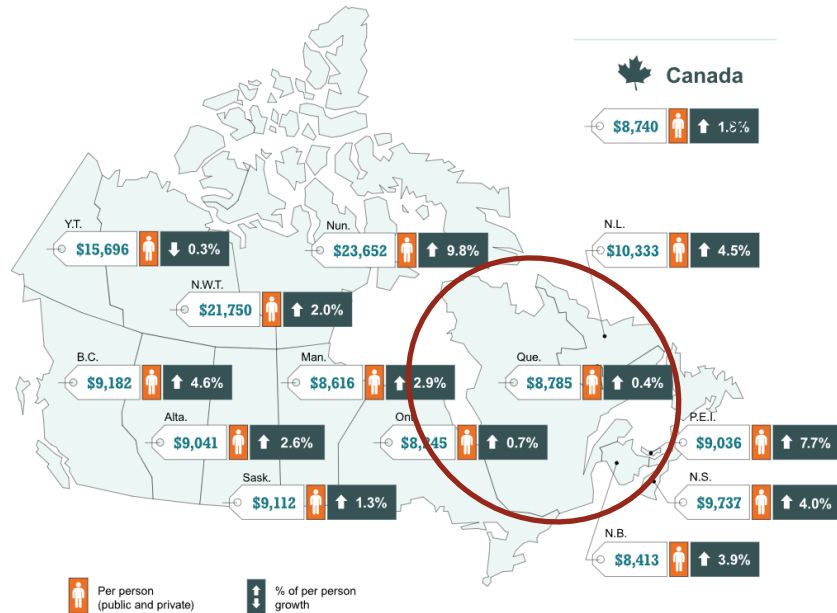
## **CODE, COST, ANALYZE AND FUND: LET'S HARNESS THE VALUE OF CASE MIX**

***Innovation in an Activity-Based Funding Environment***  
***Funding of Robot-Assisted Surgery***  
***May 29, 2024***

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- Introduction
- Activity-based funding in Quebec
- Funding of robot-assisted surgery
- Scope of the analysis
- Canadian Patient Cost Database
- Results
- Conclusion

# Canada's health systems



## 13 systems governed by *Canada Health Act* — 5 principles<sup>†</sup>

- Public administration
- Comprehensiveness
- Universality (hospital and physician services)
- Portability
- Accessibility

### Source

† Government of Canada. [Canada Health Act](#). Accessed March 13, 2024.

## 2023\*

Population ~39.3 million  
Health spending ~\$344 billion

- 26% Hospitals
- 14% Drugs
- 14% Physicians

## Quebec\*

Population ~8.7 million  
Health spending ~\$76.8 billion

- 22% of the country's spending

### Source

\* CIHI. [National health expenditure trends](#). Accessed March 24, 2024.

# Quebec to increase patient-centred funding to \$12 billion in 5 years



## Le ministre Dubé veut créer une « compétition » dans le financement des hôpitaux

D'ici cinq ans, le ministère de la Santé veut étendre un nouveau mode de financement à tous les soins physiques prodigués dans les hôpitaux, les CLSC et les cliniques.



En tout, plus de 12 milliards de dollars en soins physiques seront versés par le filtre de la FAP dans cinq ans, sans compter le soutien à domicile et les soins en santé mentale, éventuellement.

### Source

Radio-Canada. [Le ministre Dubé veut créer une « compétition » dans le financement des hôpitaux](#). June 2, 2023.



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## Chirurgie : Québec revoit le financement dans les hôpitaux en s'inspirant du privé

Selon les plans de Québec, le mode de financement FAP sera notamment étendu en 2024 aux urgences et à la dialyse, en 2025 à l'ensemble des activités en électrophysiologie et en endoscopie, en 2026 aux services ambulatoires, puis en 2027 à la pharmacie, aux laboratoires préopératoires et postopératoires.

Selon les détails divulgués mardi dans le plan budgétaire du ministre des Finances, « le ministère de la Santé élargit le financement axé sur le patient (FAP) aux secteurs de la chirurgie dès le 1<sup>er</sup> avril 2023, afin de permettre un accroissement de la performance et une réduction des délais d'attente ».

### Source

Radio-Canada. [Chirurgie : Québec revoit le financement dans les hôpitaux en s'inspirant du privé](#). March 23, 2023.

# Patient-centred funding in Quebec

<b>2023 to 2027</b>	<b>Proportion of patient-centred funding</b>	<b>Services gradually included in patient-centred funding</b>
<b>2023</b>	25%	Surgery (hospital stay), hemodynamics/interventional electrophysiology, obstetrics
<b>2024</b>	50%	Emergency, dialysis, neonatology, medical inpatients
<b>2025</b>	60% (physical)	Home support
<b>2026</b>	70%	Ambulance services
<b>2027</b>	100% (physical)	Pharmacy, laboratory

**Source**

Government of Quebec. [Le mode de financement axé sur le patient](#). 2023.

## Funding inpatient and day surgeries

- Individual price for each DRG + severity (inpatient)

## Funding adjustment

- Days outside expected length of stay
- Specific expensive supplies

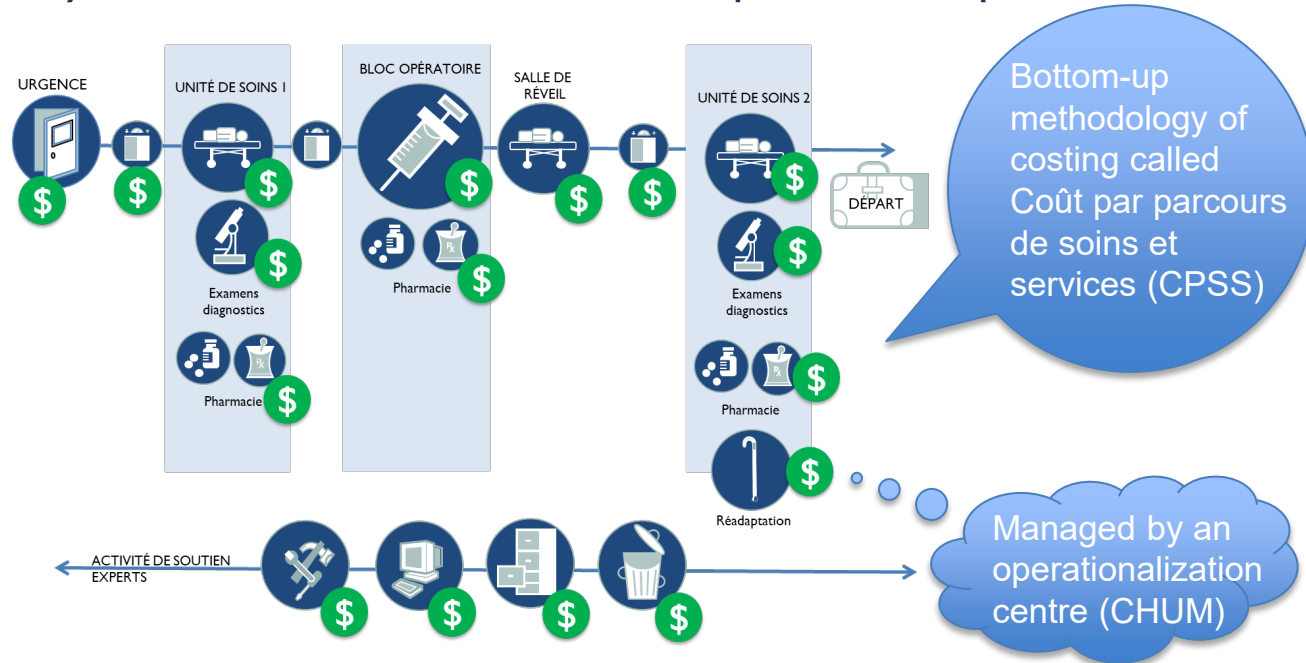


- Hospitals use da Vinci surgical system
  - Surgical supplies are more expensive than those for traditional laparoscopic approach
- Funding needs to account for the impact of delivering specialized services and promotion of innovation in health care
- Aim: Fair and efficient funding of robot-assisted surgery



# Activity-based costing in Quebec

- ABC available in Quebec beginning with financial year 2016–2017
- Analysis based on 2019–2020 to avoid pandemic impact





- Selection of main robot-assisted surgeries
  - Prostatectomy
  - Hysterectomy
  - Nephrectomy
- For each of these surgeries
  - Summary of clinical benefits
  - Cost comparison
  - Measurement and quantification of clinical and financial gains
  - Funding rate adjustment proposal
- Study by the Health and Social Services Technology Assessment Unit of CIUSSS de l'Estrie — CHUS



# Canadian Institute for Health Information



## Independent, not-for-profit organization

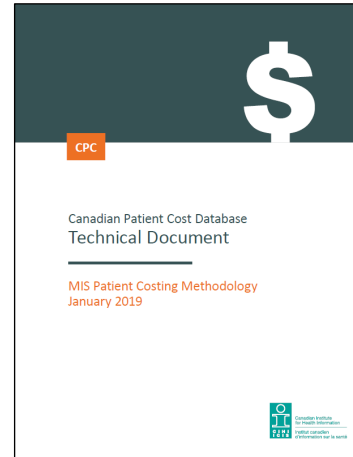
### Vision

- Better data.
- Better decisions.
- Healthier Canadians.

### Goals

- A comprehensive and integrated approach to Canada's health system data
- An expanded offering of analytics, indicators and tools to support health system decision-making
- Health information users who are better equipped and enabled to do their job

# Canadian Patient Cost Database



Though the CPCD includes only 10% of hospitals, from 4 provinces, it includes 25% to 30% of all discharges in the Discharge Abstract Database

# Data provided

Quebec uses a different acute care case-mix grouper

- DRG vs. CMG



Cases provided using specified CCI codes for

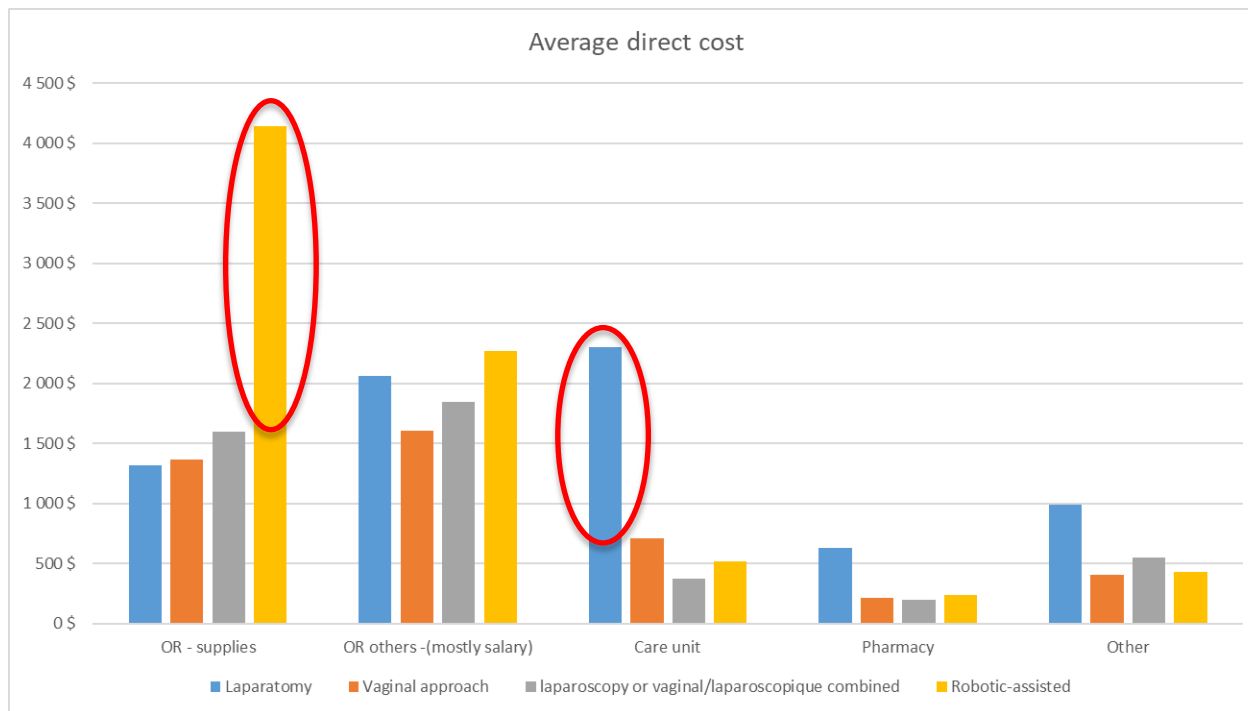
	Prostatectomy	Hysterectomy	Nephrectomy
Open approach	✓	✓	✓
Laparoscopic approach	✓	✓	✓
Vaginal approach		✓	
With robotics	✓	✓	✓

# Results: Hysterectomy

## Cost comparison



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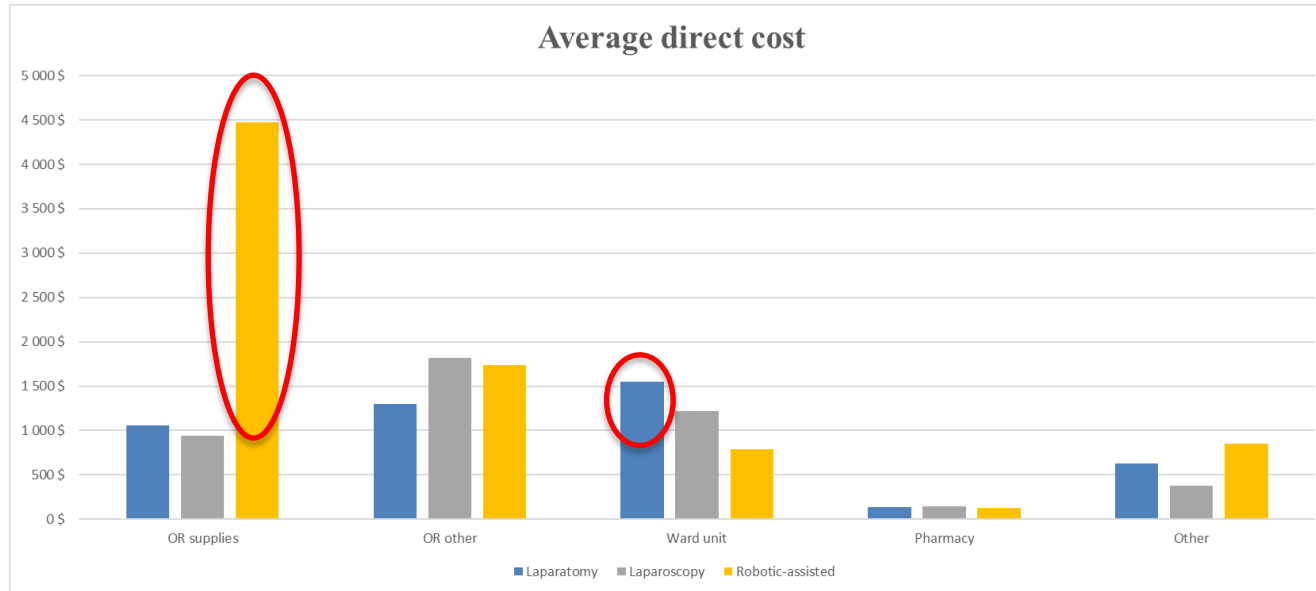


# Results: Prostatectomy

## Cost comparison



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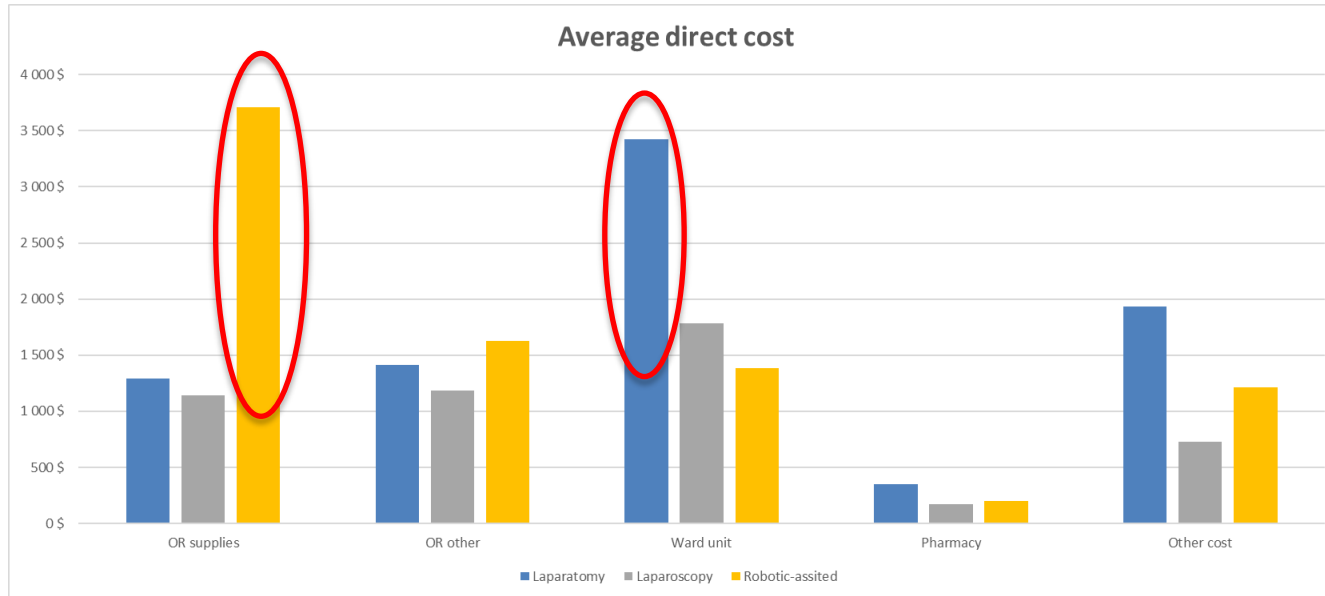


# Results: Partial nephrectomy

## Cost comparison



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# Comparative cost of robot-assisted surgeries

	Hysterectomy			Prostatectomy			Partial nephrectomy		
	LOS	OR supplies	Total	LOS	OR supplies	Total	LOS	OR supplies	Total
Laparotomy	5.6	\$1,316	\$7,301	3.3	\$1,060	\$4,667	7.1	\$1,289	\$8,417
Vaginal approach	2.0	\$1,361	\$4,302						
Laparoscopic or laparoscopy/vaginal combined	1.4	\$1,506	\$4,564	2.4	\$943	\$4,497	3.8	\$1,141	\$5,012
<b>Robot-assisted</b>	<b>1.5</b>	<b>\$4,140</b>	<b>\$7,596</b>	<b>1.7</b>	<b>\$4,478</b>	<b>\$7,981</b>	<b>3.0</b>	<b>\$3,709</b>	<b>\$8,130</b>

**LOS is lower**  
 OR supplies higher  
**Total is similar to laparotomy**

**LOS is lower**  
 OR supplies higher  
 Total cost is higher

**LOS is lower**  
 OR supplies higher  
**Total is similar to laparotomy**



- Need to consider clinical gains (value-based healthcare)
- Cost comparison includes only single surgical episode — need to consider fewer complications (lower post-operative costs) and patient comfort
- Obesity limits the use of laparoscopic and vaginal approaches for hysterectomy
- Without robot-assistance, laparoscopic approach for partial nephrectomy may result in total nephrectomy

- Modelling the cost (linear regression model) according to the parameters having an influence on cost
- Variables considered in the modelling
  - Robot usage indicator
  - LOS
  - Age
  - Severity
  - Complication or infection
  - Hospital grouping
  - DRG (for hysterectomy only)

Additional funding required for

- Robot-assisted hysterectomy: +\$3,091
- Robot-assisted prostatectomy: +\$3,516
- Robot-assisted partial nephrectomy: +\$4,040

# Results: Comparative cost data from other provinces



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## Hysterectomy

Approach	Other provinces				Québec			
	Volume	%	LOS	Direct cost	Volume	%	LOS	Direct cost
Laparotomy	3 674	29,1%	3,0	5 914,13 \$	2 412	33,7%	4,3	5 476,89 \$
Vaginal	1 893	15,0%	1,6	3 901,24 \$	1 270	17,7%	2,0	3 121,59 \$
Laparoscopy	6 833	54,1%	1,0	4 462,27 \$	3 021	42,2%	1,4	3 859,88 \$
Robotic-assisted	222	1,8%	1,1	7 867,13 \$	459	6,4%	1,5	7 596,20 \$
<b>Total</b>	<b>12 622</b>		<b>1,7</b>	<b>4 860,62 \$</b>	<b>7 162</b>		<b>2,5</b>	<b>4 512,99 \$</b>

% of additional cost robotic-assisted

61,9%

68,3%

## Prostatectomy

Approach	Other provinces				Québec			
	Volume	%	LOS	Direct cost	Volume	%	LOS	Direct cost
Laparotomy	1 258	51,6%	3,0	6 097,64 \$	603	45,7%	3,3	4 667,01 \$
Laparoscopy	93	3,8%	1,6	7 450,96 \$	118	8,9%	2,4	4 497,00 \$
Robotic-assisted	1 088	44,6%	1,8	8 472,09 \$	598	45,3%	1,7	7 980,62 \$
<b>Total</b>	<b>2 439</b>		<b>2,4</b>	<b>7 208,45 \$</b>	<b>1 319</b>		<b>2,5</b>	<b>6 154,10 \$</b>

% of additional cost robotic-assisted

17,5%

29,7%

## Nephrectomy

Approach	Other provinces				Québec			
	Volume	%	LOS	Direct cost	Volume	%	LOS	Direct cost
Laparotomy	1 032	39,0%	7,5	13 162,10 \$	370	21,7%	8,7	10 552,50 \$
Laparoscopy	1 355	51,2%	4,1	7 986,25 \$	1 209	70,8%	4,5	5 831,96 \$
Robotic-assisted	262	9,9%	3,2	9 612,62 \$	129	7,6%	3,0	8 231,01 \$
<b>Total</b>	<b>2 649</b>		<b>5,3</b>	<b>10 163,52 \$</b>	<b>1 708</b>		<b>5,3</b>	<b>7 035,75 \$</b>

% of additional cost robotic-assisted

-5,4%

17,0%

- Quebec has higher rate for robot-assisted hysterectomy and similar rates for other 2 surgeries
- Cost patterns are similar across all jurisdictions

# Results: Clinical Consultations



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Clinical benefits of robot-assisted surgeries	Hysterectomy	Prostatectomy	Nephrectomy
Shorter stay (decreased LOS)	✓	✓	✓
Improved dexterity, visualization and ergonomics for physicians	✓	✓	✓
Less operative blood loss and pain; fewer complications	✓	✓	✓
Increased instances of day surgery Avoids laparotomy for women with morphology that makes this approach difficult	✓		
Earlier return of urinary continence and erections Less urinary leakage Readmission rate is decreased ( <b>3.5% vs. 8.5% for laparotomy</b> )		✓	
Partial nephrectomy is more common than total nephrectomy			92% are partial

### Health and Social Services Technology Assessment Unit of CIUSSS de l'Estrie — CHUS

- Purpose: Advise the hospital resource allocation decisions, using an approach based on sound, scientific technology assessments and a transparent, fair decision-making process
- Robot-assisted approach: 2019 and 2022
- Study objective: Identify the clinical and organizational criteria required to ensure the efficacy and safety of using robot-assisted surgery in urology (more specifically for radical prostatectomy, radical cystectomy and partial nephrectomy) compared with open or laparoscopic surgery, with a concern for efficiency and quality

## Health and Social Services Technology Assessment Unit of CIUSSS de l'Estrie — CHUS

Clinical benefits of robot-assisted surgeries	Hysterectomy	Prostatectomy	Nephrectomy
More indicated in patients with higher Body Mass Index	✓	✓	✓
Fewer conversions to open surgery	✓		
Similar or better oncology results	✓	✓	✓
Certain tumour characteristics (size, complexity, location) are linked to better results			✓
Improved quality of life	✓		
Shorter hospital stay	✓		
Shorter recovery period	✓		
Less blood loss	✓	✓	✓

- ABF should not be a barrier to innovation
- Medical innovation is often more costly (e.g., new anticancer therapy molecules); surgical field is no exception
- Hospitals must demonstrate initiative, flexibility and responsiveness to remain at the cutting edge of modernity and provide best possible care
- Without adequate funding, specialized hospitals will not be able to introduce technologies integral for tomorrow's practice; robot-assisted approach is part of this innovation

- ABF is used for the hospital stay only; an adjustment would be needed to take into account the entire care pathway
- A more in-depth analysis of the entire care pathway would have been required to clearly conclude on the best practice
- Since regression was a bit complex and would have needed more work, the group proposed a funding adjustment for additional supply costs for all robot-assisted surgeries: \$3,313
- May need a review over time to monitor cost
  - Supply cost reduction already observed



- Government decision
  - Funding adjustment of
    - Additional \$2,677 for robot-assisted hysterectomies
    - Additional \$2,598 for robot-assisted prostatectomies

# Acknowledgements: Organizations



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*Centre intégré  
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Better data. Better decisions. Healthier Canadians.

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