## Impact of AI-Driven Sarcopenia Assessment on Costs **McGill** and Outcomes in Geriatric Oncology Surgery Fayeza Ahmad MSc, Ding Yi Zhang MD, Marco Mascarella MD MSc, Jonathan Afilalo MD MSc

### BACKGROUND

- Sarcopenia & Frailty: common in older adults undergoing abdominopelvic cancer surgery and linked to increased morbidity
- **Economic Impact:** burden of sarcopenia on resource utilization and healthcare costs is substantial, but not well quantified
- **Research Gap:** Limited quantitative studies have assessed the financial impact of sarcopenia in this surgical population

**AIM** Quantify the incremental hospitalization costs attributable to sarcopenia as assessed by a deep learning software tool that automates the measurement of skeletal muscle mass and quality volumetrically from routine preoperative CT images

### **METHODS**

- **Study Design:** Retrospective cohort study using data from the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP)
- **Patient Selection:** abdominopelvic cancer surgery patients at the McGill-affiliated Jewish General Hospital
- Sarcopenia Assessment: Al-based 3D convolutional neural **network** (coreslicer.com) analyzed preoperative CT scans to measure skeletal muscle volume and density
- **Cost Calculation:** Total hospitalization costs included hospital stay, OR/recovery room, procedures, equipment, nursing, pharmacy, and diagnostics (excluding physician fees)

**CONCLUSION**: Opportunistic assessment of sarcopenia using an automated deep learning approach identifies a subset of frail patients undergoing abdominopelvic cancer surgery that have excessive hospitalization costs and poor postoperative outcomes.

 $\rightarrow$  Interventions such as prehabilitation may be targeted to these patients to mitigate their risks.

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### RESULTS

Table 1: Baseline characteristics

Variable	Total N=1516	
Age at surgery (years)	67.0 (58.0-75.0)	
Weight (kg)	74.0 (62.3-85.0)	
Height (cm)	167.0 (160.0-174.0)	
BMI	26.1 (23.0-29.7)	
Female sex	750 (49%)	
Cancer type:		
- Colorectal	85 (35%)	
- Gastrointestinal	12 (5%)	
- Genitourinary	49 (20%)	
- Gynecological	30 (12%)	
- Hepatobiliary	44 (18%)	
- Pancreatic	25 (10%)	
Psoas Muscle Area Index	<b>x</b> 165.0 (134.3-202.9)	
Psoas Muscle Density	51.5 (45.9-56.1)	
Total Costs (CAD)	$100178(71711_{-}157111)$	

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Age per 10 years	
Female Sex	
Cancer	
Colorectal	
Gastrointestinal	
Genitourinary	
Gynecological	
Hepatobiliary	
Pancreatic	
ASA class	
Disability	
CT Muscle Status	
No Sarcopenia	
Pre-Sarcopenia	

Sarcopenia

Figure 1: Box plot of Post-Operative Length of Stay stratified by CT Muscle Status



incremental 9 day longer LOS!



Hôpital général juif Jewish General Hospital

### Regression of Cost

Coefficient	95% CI	P-value
-1038.18	-2024.94, -51.42	0.04
-1558.88	-4073.32, 955.56	0.22
1 -579.07 -6002.27 -4487.49 5461.59 6552.66	Referent -6479.77, 5321.64 -9084.45, -2920.09 -7940.91, -1034.07 1959.47, 8963.70 2059.37, 11045.95	0.85 <0.001 0.01 0.002 0.004
3597.42	1829.37, 5365.46	<0.001
18450.05	11109.43, 25790.66	<0.001
1 2455.74 9482.52	Referent -96.52, 5008.00 6149.53, 12815.51	0.06 <0.001

### Figure 2: Box plot of Direct Hospitalization Costs stratified by CT Muscle Status

**Cancer Programs** 

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