

# Outcomes of surgery in patients 90 years of age and older

## A retrospective cohort study

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# Introduction

- The number and proportion of older patients is increasing worldwide:
- In the United States, people aged 85 years and above is expected to increase from 2% in 2020 to 4.5% by 2050
- In Israel in 2015, 2.9% of the population were 80 years and older, and this is estimated to increase to 4.9% by 2040
- More than half of all surgical procedures are performed in older adults

1. *An aging nation: the older population in the United States*. Washington, DC: United States Census Bureau, 2019

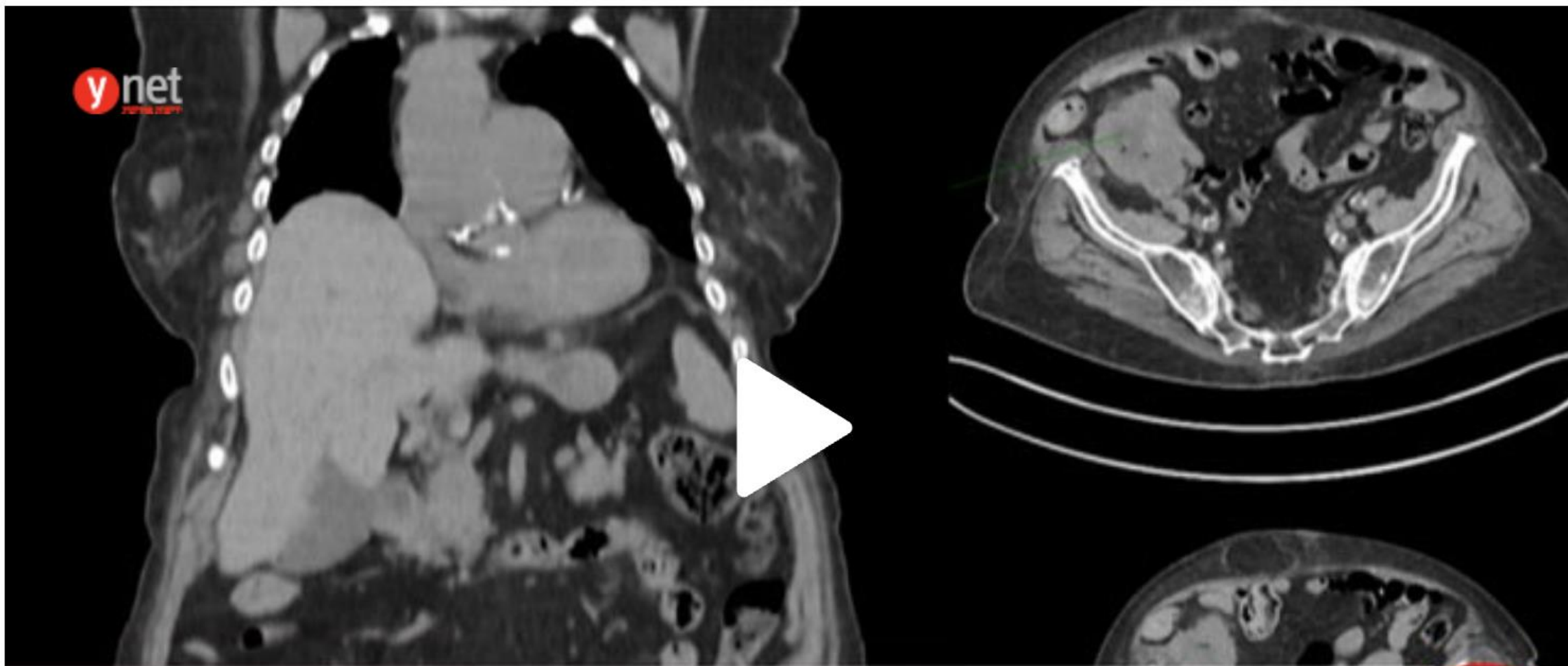
2. CBS (Central Bureau of Statistics, Israel). *Statistical Abstract of Israel 2017*.



# בת 100 עברה ניתוח להוצאת גוש גדול מהמעי הגס - וחגגה עם צ'ייסר של קוניאק

הגידול שהוסר מגופה של יוכבד אהרונסון היה בגודל של אשכולית והתפתח לפני יותר משנה, אבל עד לאחרונה היא לא סבלה ממנו. אחרי שהחל להפריע לה, עברה בדיקות, ובעקבותיהן נכנסה לחדר הניתוח בבילינסון. "אין לי כאבים, תודה לאל", סיפרה לאולפן ynet. "אני קצת עייפה, קצת הרבה, אבל זהו, הכול בסדר"

אלכסנדרה לוקש | 26.04.22 | 12:45



בת 100 עברה ניתוח להוצאת גוש במעי בגודל אשכולית



בריאות

# שיא ישראלי שובר את תקרת הגיל: תרומת ריאות מבת 86

קלרה אלקיים ז"ל הייתה חתומה על כרטיס אדי ובזכותה שני אנשים זכו בחיים חדשים, אחד מהם חולה קשה שהמתין זמן רב להשתלה. "הגיל כבר אינו קריטריון עבורנו, אלא תפקודי האיברים", מסבירים המומחים. "אמא הייתה אדם מלא חסד, שמחת חיים ואהבת אדם", מספרת בתה של התורמת

מעין פלג אבירם | 30.01.22 | 13:33



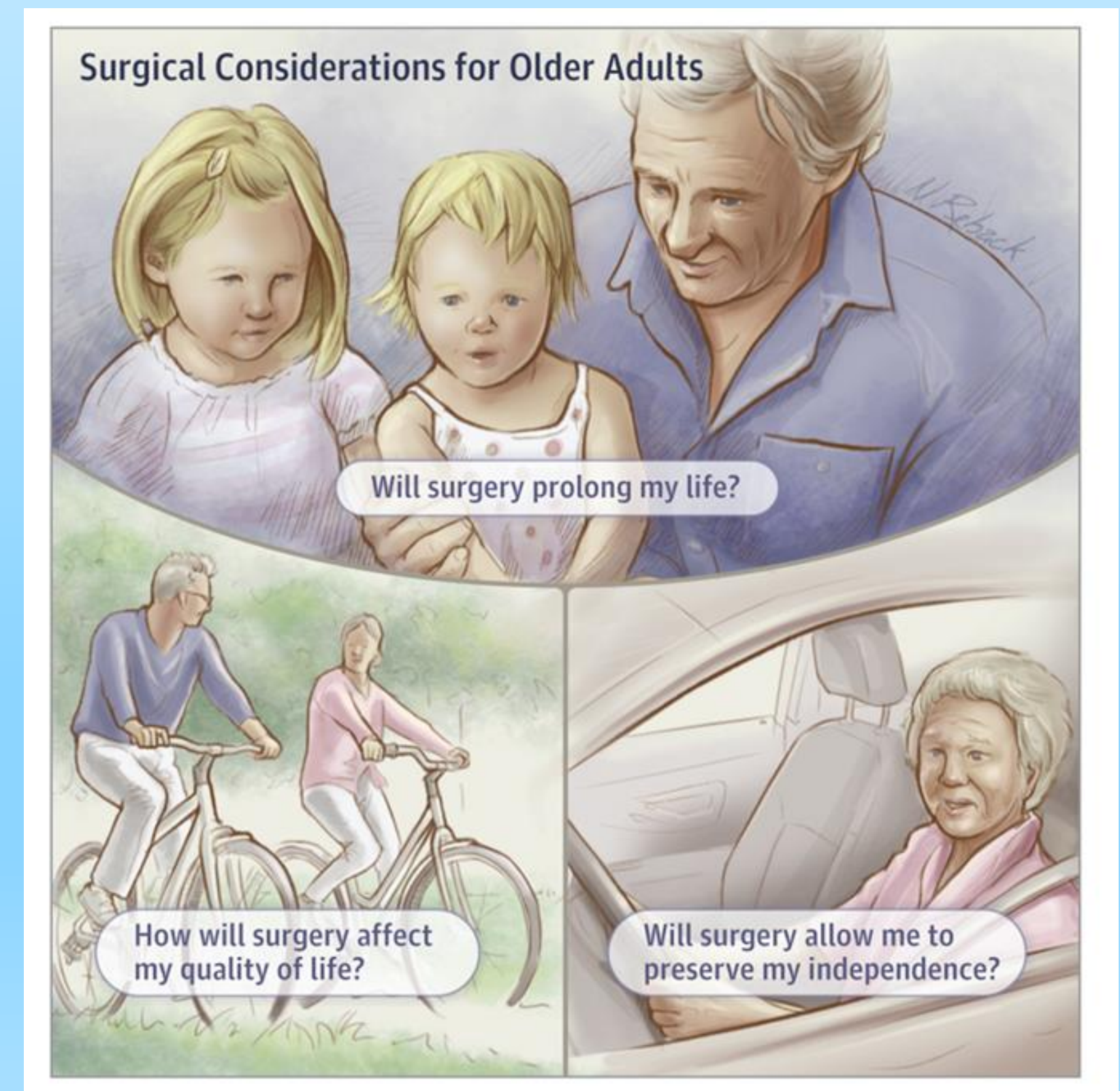
השתלת ריאות ראשונה בישראל מתורמת בת 86 נערכה בשבוע שעבר בגבר בן 65 במרכז הרפואי שיבא, זאת במקביל לתרומת כבד, מאותה אישה, שהושתל בחולה קשה באיכילוב. "מבוגרים בני 80 ויותר יכולים לתרום איברים כי בריאותם טובה יותר, הודות לפעילות גופנית, תזונה נכונה ומודעות למניעת מחלות", הסבירה ד"ר גניה מחמיד, מנהלת היחידה לטיפול נמרץ נויורוכירורגי ברמב"ם.





# Introduction

- Surgeons need to discuss clearly and honestly with patients and their families about the benefits of surgical interventions, and what risks they are willing to accept from such an intervention
- *Dilemmas*... Ethical, Medical, and Religious concepts







## About Choosing Wisely UK

Choosing Wisely UK is part of a global initiative aimed at improving conversations between patients and their healthcare professionals.

Choosing Wisely UK was launched in 2016 by the Academy of Medical Royal Colleges as a way to identify tests, treatments and procedures of questionable value meaning that the appropriateness of their use should be discussed carefully with patients before being carried out. This work has since been superseded by other initiatives such as Evidence based Interventions and rethinking medicine.

## Shared decision making

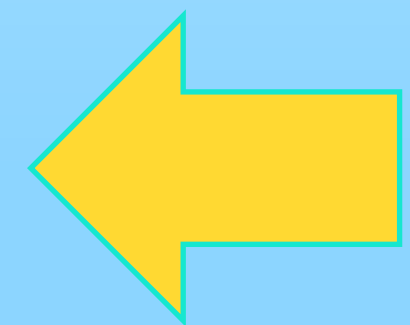
The focus of Choosing Wisely UK is now about shared decision making using BRAN to encourage patients get the best from conversations with their healthcare professional by asking four questions.

1. What are the Benefits?
2. What are the Risks ?
3. What are the Alternatives?
4. What if I do Nothing?

This is a collaborative process in which doctors and healthcare professionals work together with patients to select

FOUR QUESTIONS TO  
ASK MY CLINICIAN OR  
NURSE TO MAKE  
BETTER DECISIONS  
TOGETHER

1. What are the Benefits?
2. What are the Risks?
3. What are the Alternatives?
4. What if I do Nothing ?



# Aim of the study

To review the etiology, clinical presentation, post-operative outcomes and survival rates of nonagenarians who underwent surgery in a general surgical department, at a large volume, academic center.



# Methods

## *Study Design:*

*Retrospective cohort study*

## *Patient population:*

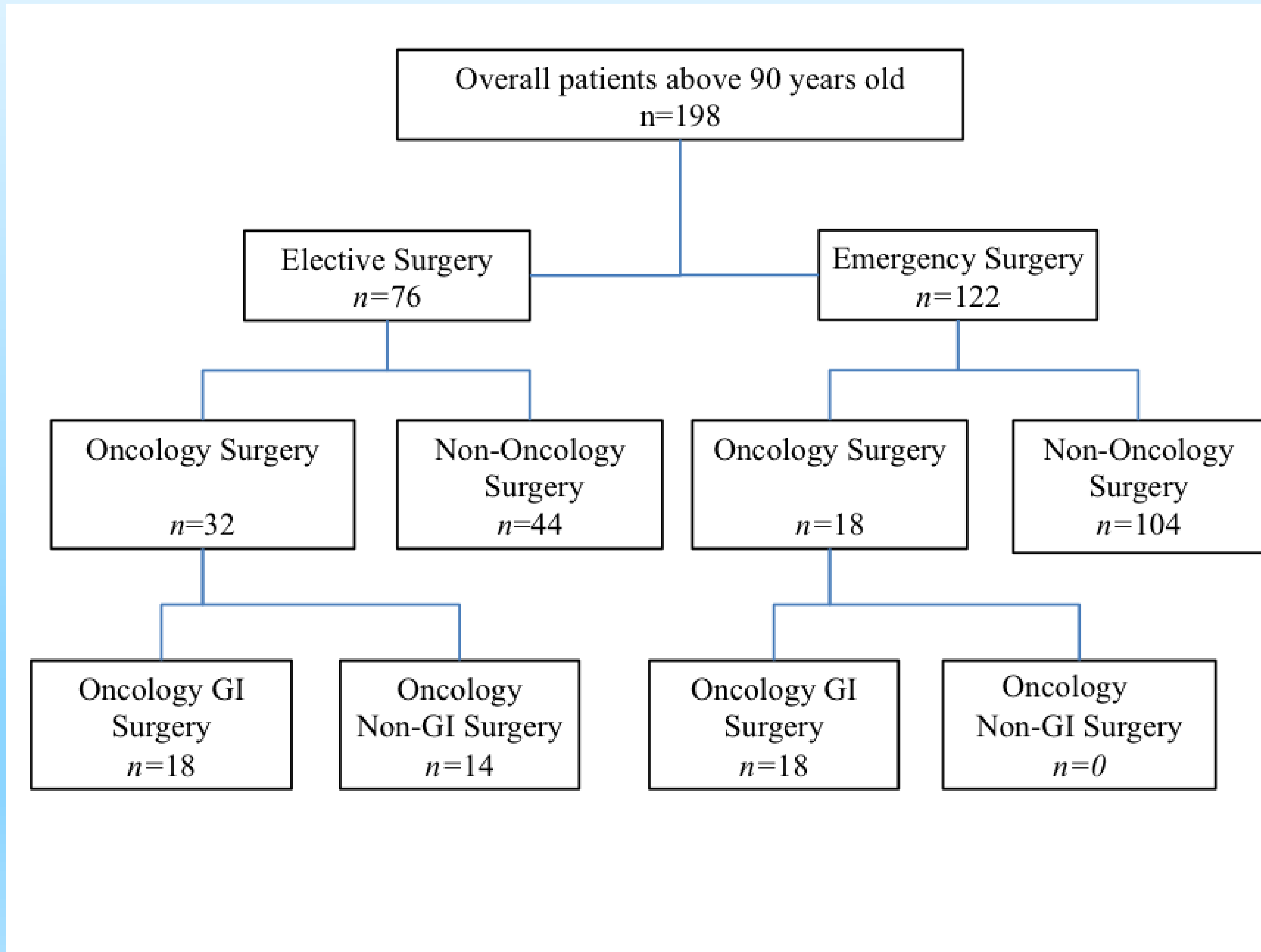
*All consecutive patients aged 90 years and older who underwent curative or palliative surgery between January 2014 and December 2018*

## *Endpoints:*

*Primary endpoint - post-operative outcomes*

*Secondary endpoint - long-term survival*

# Surgery distribution according to surgery type and diagnosis





# Results

# Pre-operative baseline characteristics:

	Elective surgery n=76		Emergency surgery n=122		P-value
Diagnosis	Oncology n=32	Non-Oncology n=44	Oncology n=18	Non-Oncology n=104	
<b>Gender</b> <i>Female No.(%)</i>	18 (56.3)	15 (34.1)	14 (77.8)	57 (54.8)	0.04
<b>Age</b> <i>Median (Range(</i>	91 (90-99)	92 (90-98)	92 (90-100)	93 (90-101)	0.053
<b>Place of residency</b>					0.003
Home <i>No. (%)</i>	29 (90.6)	42 (95.5)	13 (72.2)	82 (78.8)	
Institute <i>No. (%)</i>	3 (9.4)	2 (4.5)	5 (27.8)	22 (21.2)	
<b>Functional Status</b> <i>No. (%)</i>					0.0005
Independent	19 (59.4)	35 (79.5)	6 (33.3)	45 (43.3)	
Partially dependent	6 (18.8)	5 (11.4)	5 (27.8)	35 (33.7)	
Full dependent	7 (21.9)	4 (9.1)	7 (38.9)	24 (23.1)	
<b>CCI Score</b> <i>(Mean, STD(</i>	6 ±1.6	5 ±1.1	7 ±2.4	6 ±1.7	0.15
<b>ASA Score</b> <i>(Mean, STD(</i>	2 ±0.7	2 ±0.6	2 ±0.7	2 ±0.7	0.058



# Pre-operative baseline characteristics

## Type of operations:

	Elective surgery n=76		Emergency surgery n=122	
Diagnosis	Oncology n=32	Non-Oncology n=44	Oncology n=18	Non-Oncology n=104
Diagnosis <i>No. (%)</i>				
Abdominal wall hernia	-	21 (47.7)	-	34 (23.7)
Symptomatic biliar disease	-	13 (29.6)	-	14 (13.5)
Colorectal disease	13 (40.6)	4 (9.1)	15 (83.3)	18 (17.3)
Foregut disease	5 (15.6)	6 (13.6)	3 (16.7)	4 (3.8)
Small bowel obstruction	-	-	-	20 (19.2)
Acute mesenteric event	-	-	-	4 (3.8)
Non-GI cancer	14 (43.8)	-	-	-
Perianal abscess	-	-	-	9 (8.7)
Acute appendicitis	-	-	-	1 (1.0)

# Post-operative outcomes according to surgery type:

	Overall n=198	Elective Surgery n=76	Emergency Surgery n=122	P-value
<b>Postoperative Mortality - 30 days</b> <i>No. (%)</i>	53(26.8)	5(6.6)	48(39.3)	<0.001
<b>Complication</b> <i>No. (%)</i>	83 (41.9)	17 (22.4)	66 (54.1)	<0.001
<b>CDS ≤2</b>	34	11	23	
<b>CDS &gt;2</b>	49	6	43	
<b>Reoperation during the same admission</b> <i>No. (%)</i>	19 (9.6)	3 (3.9)	16 (13.1)	0.046
<b>Admission to ICU</b> <i>No. (%)</i>	31 (15.7)	2 (2.6)	29 (23.8)	<0.0001
<b>Length of stay,</b> <i>Day (Mean, STD)</i>	4 ±9.2	2 ±7.8	6 ±9.8	<0.0001
<b>Discharge to rehabilitation facilities</b> <i>No. (%)</i>	17 (8.6)	3 (3.9)	14 (11.5)	0.07



# Univariate and Multivariate Logistic Regression Analysis for predicting Peri-operative complications:

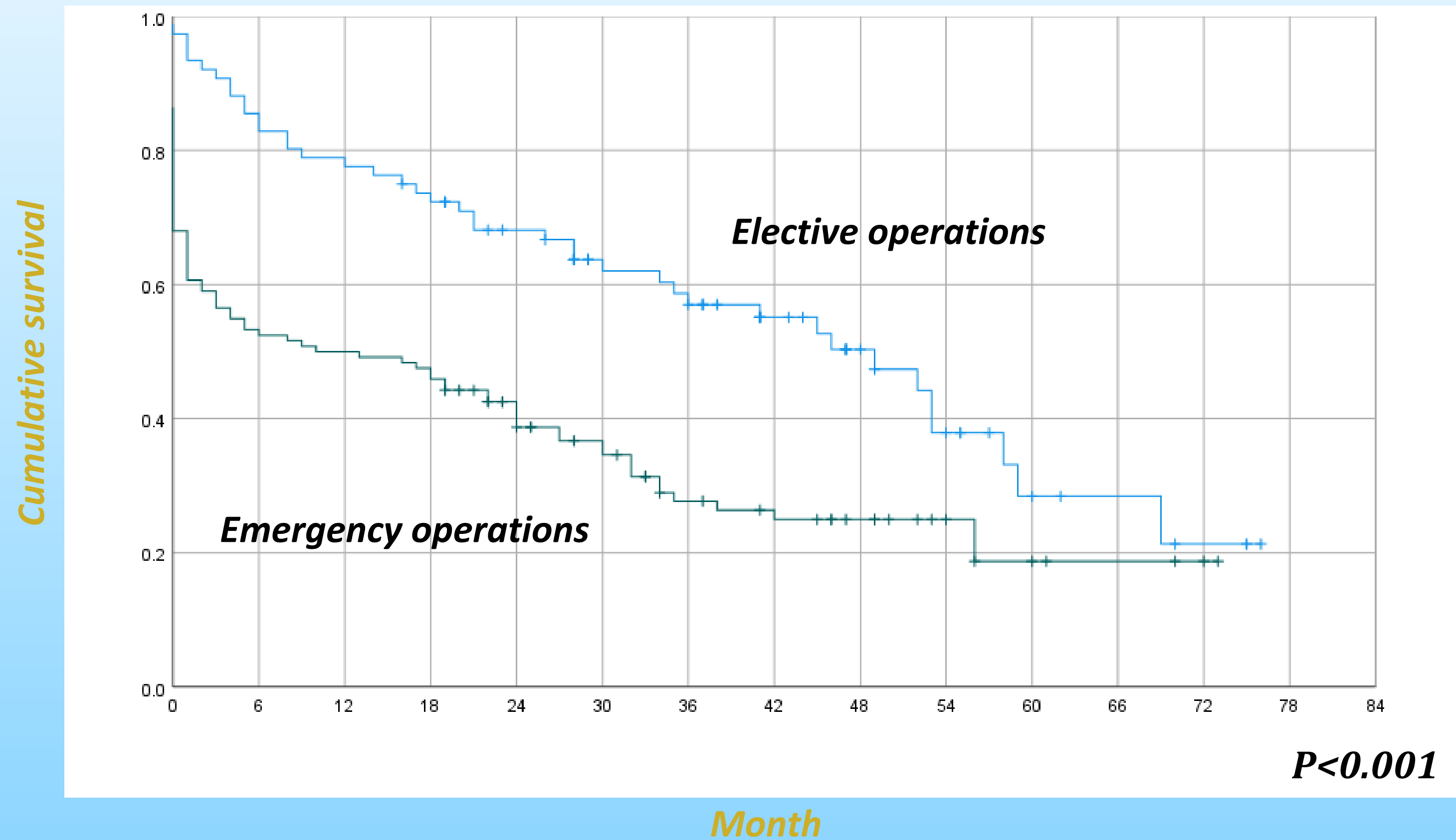
	Univariate Analysis			Multivariate Analysis		
	OR	95% CI	P-value	OR	95% CI	P-value
<b>Age</b>	0.99	0.994-1.100	0.048	1.028	0.898-1.176	0.69
<b>Gender</b> ( <i>ref. Female</i> )	0.772	0.521-1.144	0.197	0.669	0.349-1.283	0.226
<b>Age-adjusted CCI</b>	0.969	0.925-1.015	0.183	1.091	0.88-1.34	0.407
<b>Presentation</b> ( <i>ref. Emergency</i> )	4.405	2.298-8.442	<0.001	3.384	1.669-6.859	0.001
<b>Type of surgery</b> ( <i>ref. Oncology</i> )	1.004	0.522-1.932	0.99	1.83	0.766-4.401	0.173
<b>Pre-operative Residency</b> ( <i>ref. Long term care facilities resident</i> )	1.000	0.5-2.0	1.00	-	-	-
<b>Functional Status</b> ( <i>ref. Partially and fully Dependent</i> )	1.082	0.611-1.913	0.788	-	-	-
<b>ASA score</b>	0.912	0.809-1.028	0.131	-	-	-

## Univariate and Multivariate Logistic Regression Analysis for predicting postoperative two year survival:

	Univariate Analysis			Multivariate Analysis		
	OR	95% CI	P-value	OR	95% CI	P-value
<b>Age</b>	0.842	0.745-0.952	0.006	0.819	0.697-0.961	0.014
<b>Gender</b> ( <i>ref. Female</i> )	1.141	0.653-1.996	0.643	2.266	1.089-4.716	0.029
<b>Age-adjusted CCI</b>	0.682	0.557-0.834	<0.0001	0.688	0.535-0.886	0.004
<b>Presentation</b> ( <i>ref. Emergency</i> )	0.322	0.177-0.585	<0.001	0.469	0.225-0.977	0.043
<b>Type of surgery</b> ( <i>ref. Oncology</i> )	0.744	0.389-1.422	0.371	-	-	-
<b>Pre-operative Residency</b> ( <i>ref. Long term care facilities resident</i> )	0.205	0.08-0.523	0.001	0.249	0.072-0.859	0.028
<b>Functional Status</b> ( <i>ref. Partially and fully Dependent</i> )	0.657	0.374-1.152	0.143	-	-	-
<b>ASA score</b>	0.464	0.295-0.73	0.001	0.592	0.347-1.011	0.055

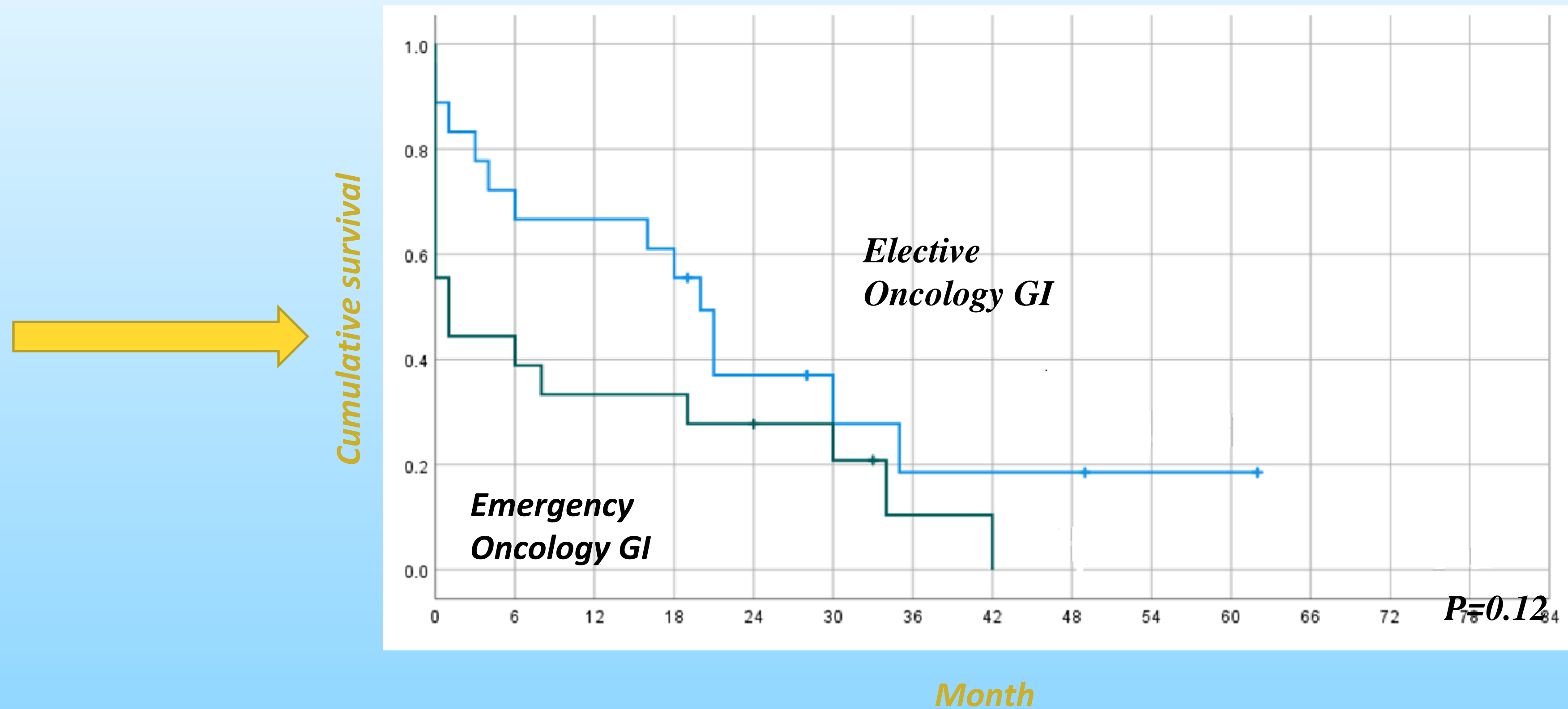


# Survival curves according to type of surgery and diagnosis



	<b>30 days</b>	<b>3 month</b>	<b>24 month</b>	<b>Median survival</b>
<b>Elective operations</b>	93.4%	90.8%	68.1%	49 m
<b>Urgent operations</b>	60.7%	56.6%	38.7%	10 m

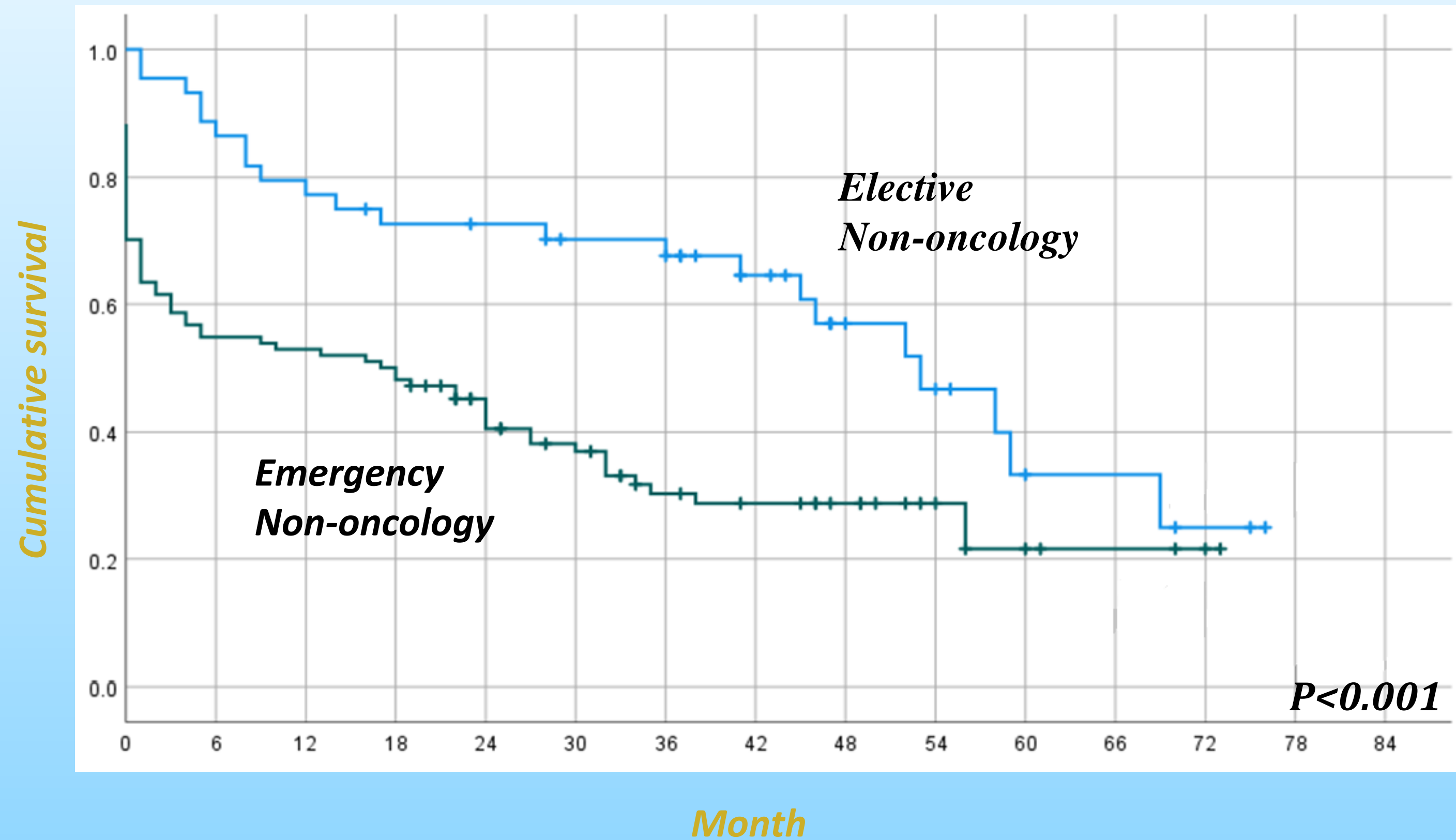
# Survival curves according to type of surgery and diagnosis



	30 days	3 month	24 month	Median survival
<b>Elective Oncological GI operation</b>	83.3%	77.8%	37.0%	20 m
<b>Urgent Oncological GI operation</b>	44.4%	38.9%	27.8%	1 m



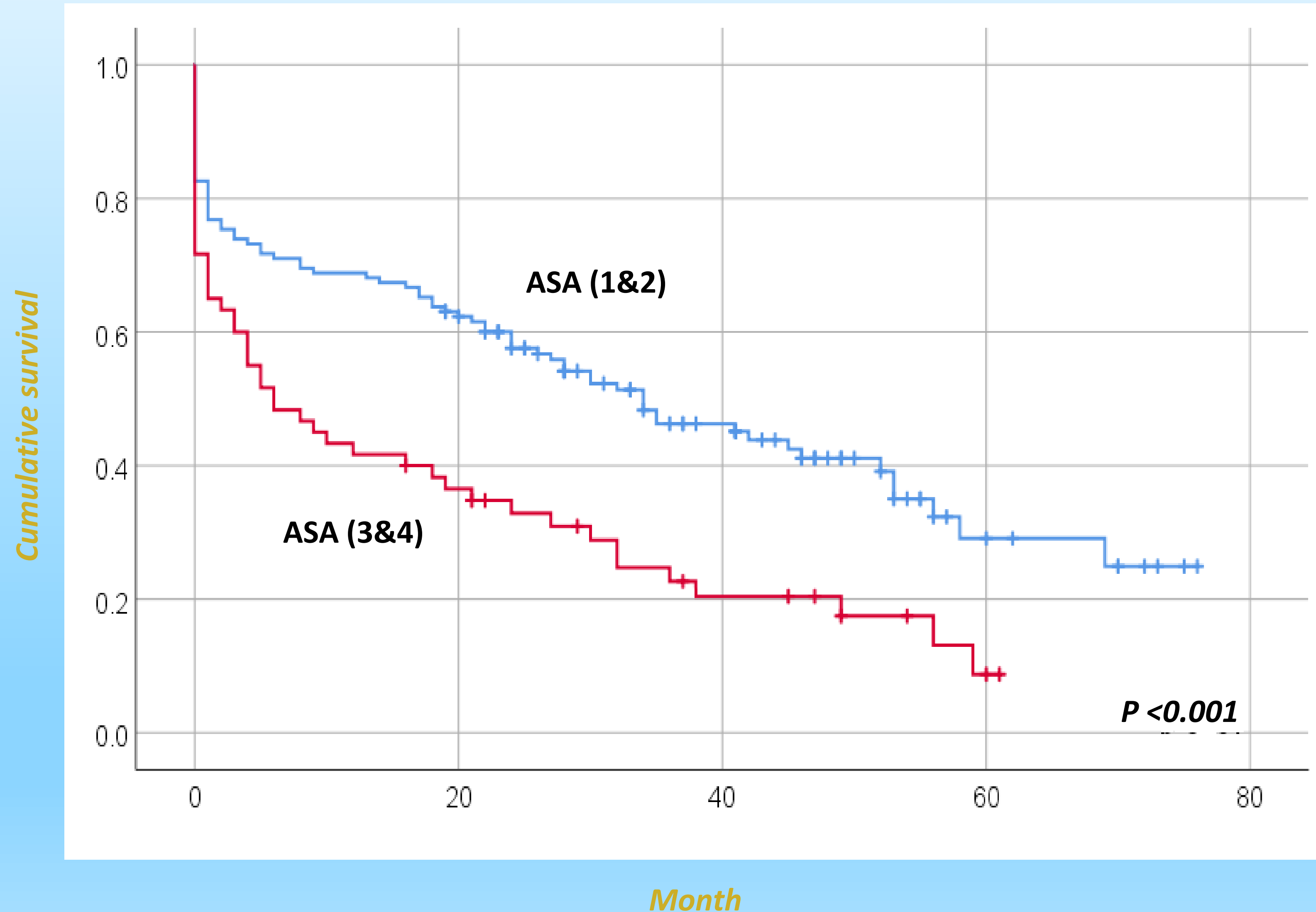
# Survival curves according to type of surgery and diagnosis



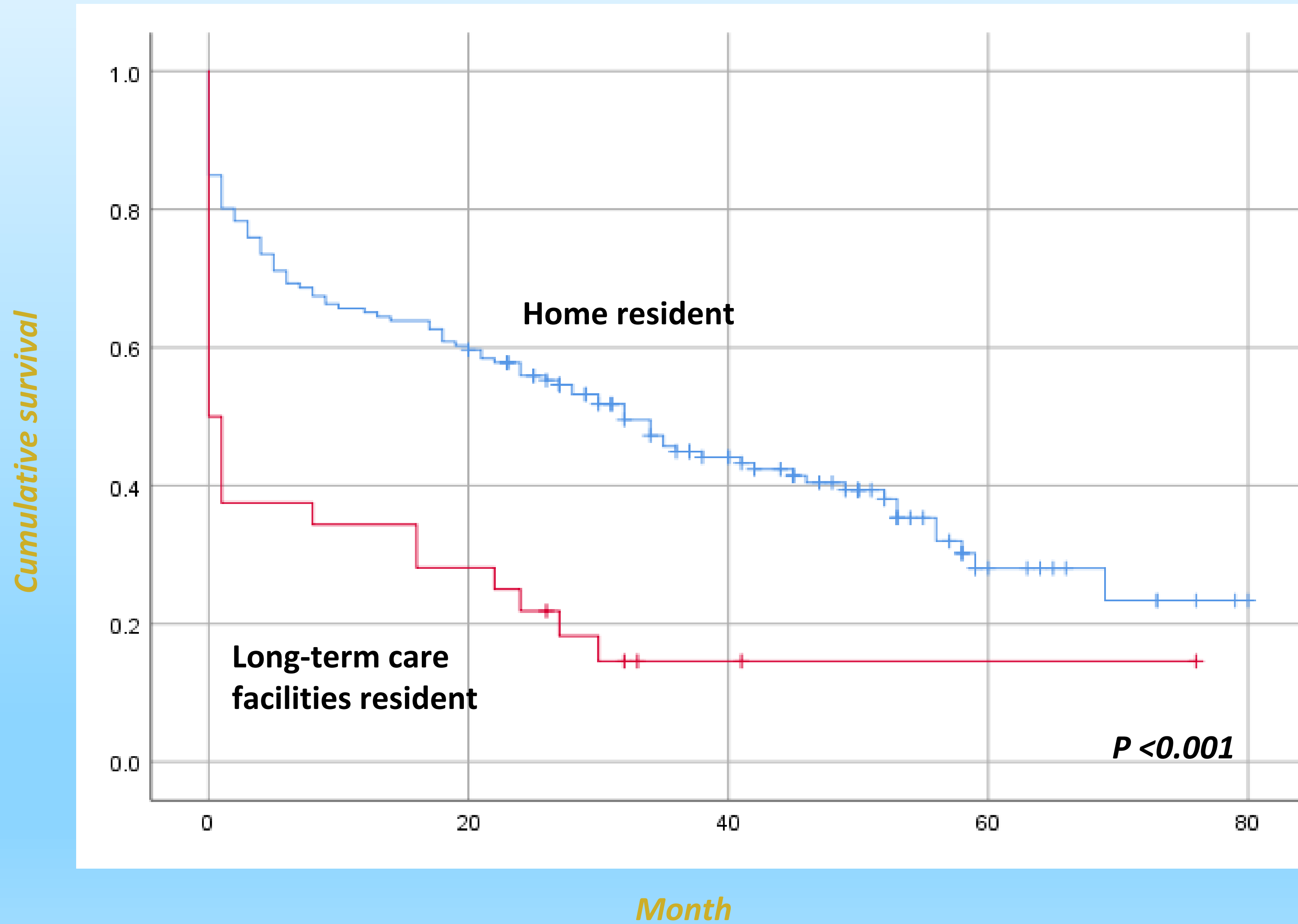
	30 days	3 month	24 month	Median survival
<b>Elective Non-oncological Surgeries</b>	95.5%	95.5%	72.7%	53 m
<b>Urgent Non-oncological Surgeries</b>	63.5%	58.7%	40.6%	17 m



# Survival curves according to ASA Score

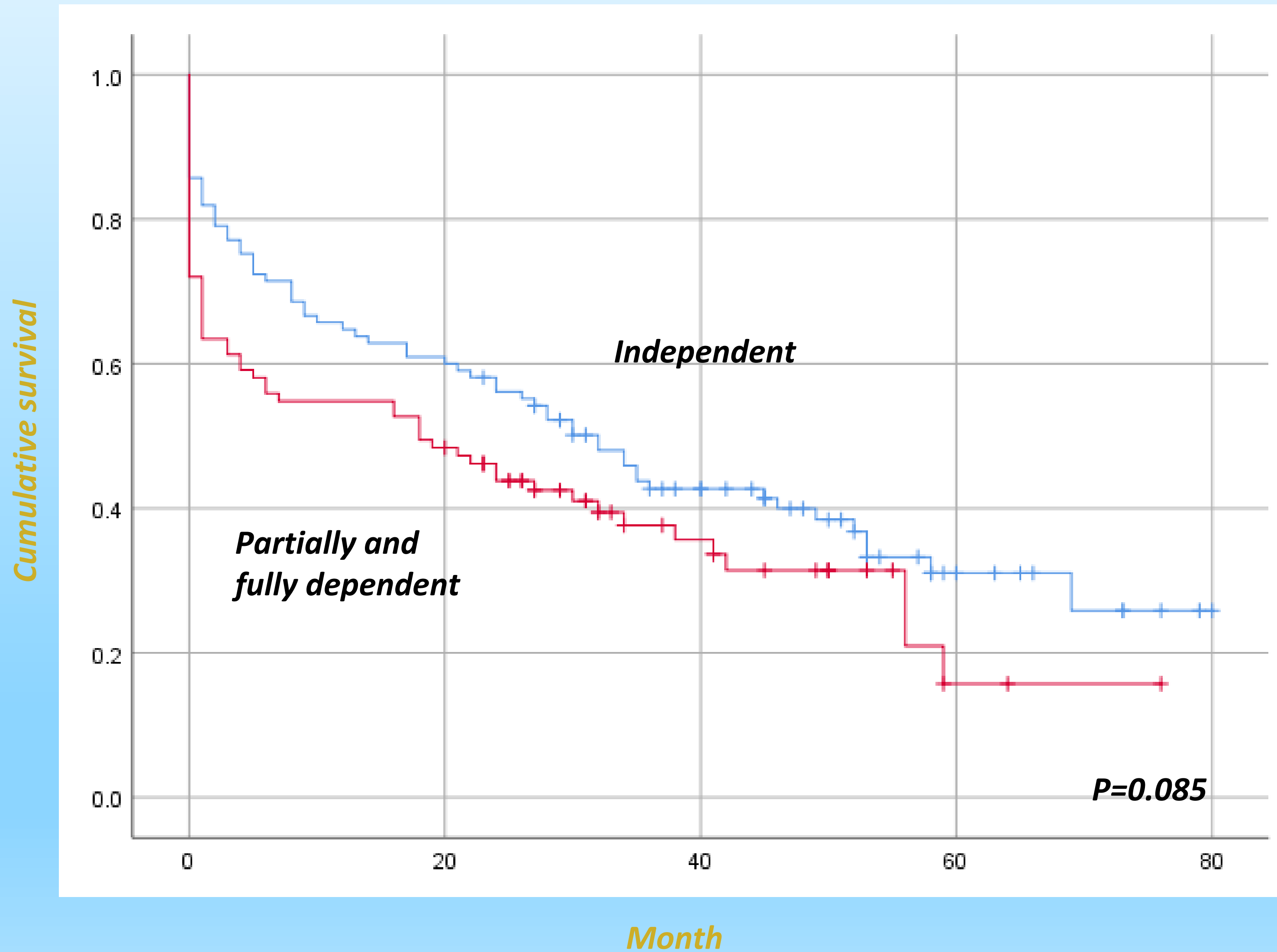


# Survival curves according to preoperative residency





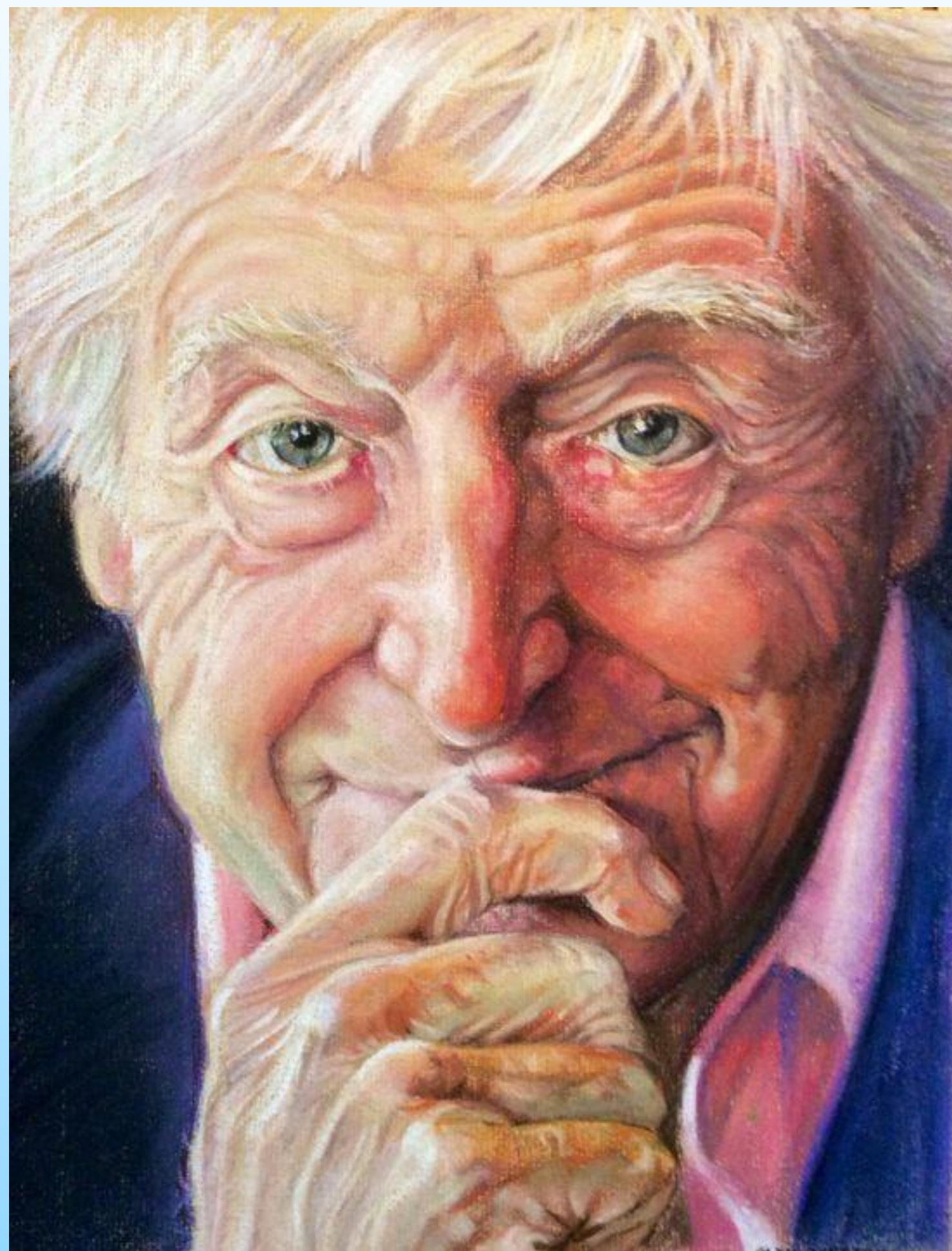
# Survival curves according to functional status



*Functional assessment alone is not sufficient to determine long term outcomes in this population- the importance of CGA!*

# Conclusion:

- Elective surgery can be safely performed in nonagenarians with acceptable post-operative and long-term outcomes especially in non-oncology elective surgeries
- Emergency surgery for oncology diagnoses carries a very high risk of perioperative morbidity and mortality and therefore palliative approaches should be considered



*Thank you*

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