

## Abstract

**AIM:** Understand key risk factors when considering pancreaticoduodenectomy (PD) procedures for octogenarian pancreatic cancer patients.

**METHODS:** A retrospective chart review was performed of patients at Loyola University Medical Center (LUMC) who underwent a PD from 2007 to 2018. Perioperative variables were evaluated, including postoperative outcomes.

**RESULTS:** 244 patients underwent a PD, 25 (10%) were octogenarians (≥80 yrs old). There was a trend towards an increase in post-operative length of stay for the octogenarians (15.1 days) vs non-octogenarian group (11.4 days). Octogenarians were significantly more likely to be discharged to a skilled nursing facility (SNF). There was no significant difference in post-operative infection rates, 30 day mortality, and 1-year mortality between both groups.

**CONCLUSION:** This study demonstrates that performing a PD in a selected group of octogenarians is safe at LUMC, although they are more likely to require a SNF.

## Introduction

Pancreatic cancer is the fourth leading cause of cancer deaths in the United States, with 45,750 deaths estimated for 2019.<sup>1,2</sup> Surgical resection, specifically pancreaticoduodenectomy (PD), offers highest survival chances for patients with pancreatic and periampullary cancer. Like many surgical procedures, increased age reduces a patient's likelihood to undergo a PD.<sup>3</sup> PD will likely become more common in the octogenarian age group as the elderly population increases.<sup>4</sup> Some research has shown that octogenarian patients have worse postoperative outcomes after PD compared to their younger counterparts.<sup>1,2,3,4</sup> Given the conflicting evidence regarding morbidity of PD in octogenarians, our study was designed to examine this cohort in more detail.

## Methods

A retrospective chart review was completed on 244 patients undergoing a PD from 2007 to 2018 at LUMC. Patients were categorized into two groups: the octogenarian group and the non-octogenarian group based on age at time of surgery. Variables included demographic data and post-operative outcomes. Differences between the two groups were evaluated using chi-square and independent sample t-test analyses.

## Results

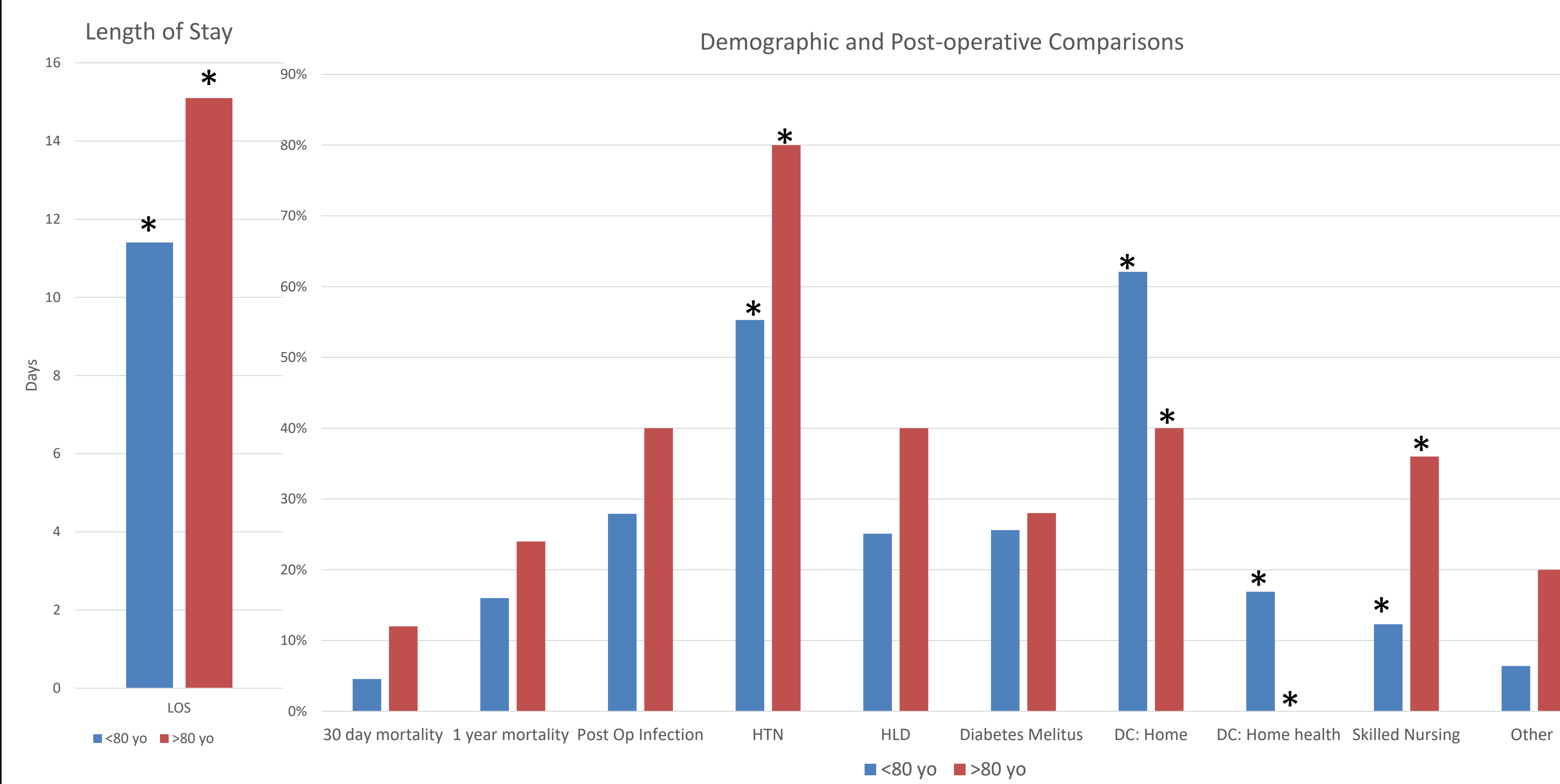
Table 1: Demographic Data

	Non-octogenarian (<80 years)	Octogenarian (≥80 years)	P value
<b>Total (N)</b>	219	25	
<b>Male gender</b>	116 (53%)	15 (60%)	0.50
<b>Age (mean ± SD)</b>	63.3 years ± 10.7	83.6 years ± 3.3	-
<b>Comorbidities</b>			
- Hypertension	121 (55.3%)	20 (80.0%)	<b>0.010</b>
- History of smoking	95 (43.4%)	13 (52%)	0.411
- Hyperlipidemia	55 (25.1%)	10 (40.0%)	0.548
- Diabetes mellitus	56 (25.6%)	7 (28.0%)	0.397
<b>Body Mass Index</b>	25.8 ± 5.0	24.9 ± 3.5	0.390

Table 2: Post-operative data comparing octogenarian and non-octogenarian PD patients

	Non-octogenarian (<80 years)	Octogenarian (≥80 years)	P (<0.05)
<b>Total (N)</b>	219	25	
<b>Length of stay (mean ± SD)</b>	11.4 days ± 8.8	15.1 days ± 11.4	<b>0.05</b>
<b>30 day mortality</b>	10 (4.57%)	3 (12.0%)	0.117
<b>1 year mortality</b>	35 (16.0%)	6 (24.0%)	0.310
<b>Post-op infection</b>	61 (27.9%)	10 (40%)	0.205
<b>Discharge Location</b>			<b>0.00015</b>
- Home	136 (62.1%)	10 (40%)	
- Home health	37 (16.9%)	0 (0%)	
- Total Home	173 (79%)	10 (40%)	<b>0.00002</b>
- Skilled nursing	27 (12.3%)	9 (36%)	<b>0.0016</b>

Figure 1 & 2: Post op comparisons for octogenarian and non-octogenarian PD patients.



## Results

There was no statistical significance in gender or body mass index. Hypertension was the only comorbidity found to be significantly increased in the octogenarian group compared to the non-octogenarians (Table 1).

Postoperative morbidity and mortality were similar between the two groups. Length of stay was longer in the octogenarian group, at 15.1 days, compared to the 11.4 days in the non-octogenarian cohort, which was statistically significant ( $p < 0.05$ ). Discharge locations were significantly different between the two groups. 62% of the non-octogenarian patients were discharged to home and almost 17% of the group went home with home health assistance, compared to 40% and 0% of the octogenarians, respectively. 36% of the octogenarians were discharged to a skilled nursing facility, compared to only 12% of the non-octogenarian group (Table 2). Figures 1 and 2 show graphical comparisons of the data.

## Conclusions

Experience at LUMC has demonstrated a PD in the octogenarian patient population is safe in carefully selected patients. This study suggests that age should not be a discriminating factor alone when deciding if PD can be tolerated by a patient over the age of 80 years. Patients should be aware of higher likelihood of longer hospital stay and discharge to a SNF vs home, compared to younger patients.

## Acknowledgements

The Surgery Department at LUMC supported this project, specifically the Surgical Oncology division. We are especially appreciative of the surgical attendings and residents at LUMC for allowing us to pursue our research goals and for the mentoring we continue to receive from them.

## References

- Patil S, Chamberlain RS. Long term survival outcomes in octogenarians and nonagenarians undergoing the Whipple procedure for pancreatic adenocarcinoma: A United States population-based study (Surveillance, Epidemiology and End Results [SEER] Database, 1998-2011). *Journal of the American College of Surgeons*. 2015;221(4).
- Sperli C, Moletta L, Pozza G. Pancreatic resection in very elderly patients: A critical analysis of existing evidence. *World Journal of Gastrointestinal Oncology*. 2017;9(1):30.
- Melis M, Marcon F, Masi A, et al. The safety of a pancreaticoduodenectomy in patients older than 80 years: risk vs. benefits. *HPB*. 2012;14(9):583-588.
- Kim SY, Weinberg L, Christophi C, Nikfarjam M. The outcomes of pancreaticoduodenectomy in patients aged 80 or older: a systematic review and meta-analysis. *HPB*. 2017;19(6):475-482.