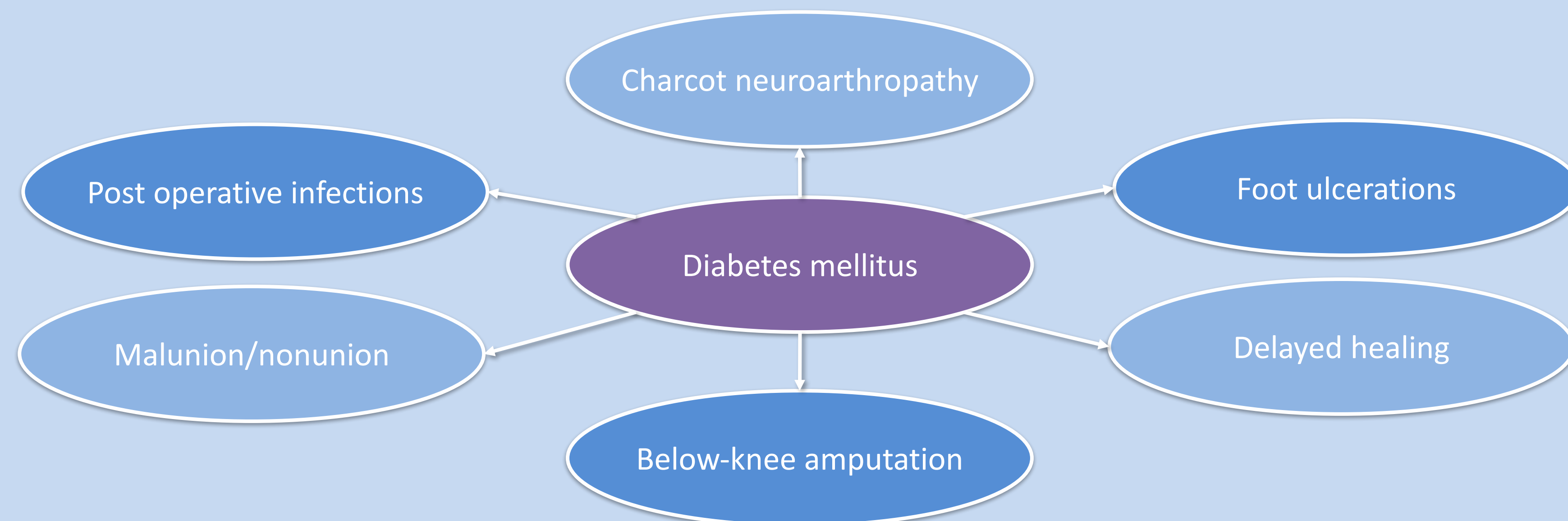


Introduction

- ❖ Ankle fractures epidemiology
 - ❖ About 260,000 ankle fractures occur every year in the United States alone [3]
 - ❖ Accounts for 9% of all fracture injuries in adults [1]
 - ❖ Most common fracture involving the articular surface of weight bearing joint [2]
- ❖ Percival Pott ankle fracture classification system: unimalleolar, bimalleolar, trimalleolar [4]
- ❖ Open reduction and internal fixation (ORIF)
 - ❖ Surgery where bones are first reduced back into normal anatomical position and then metal rods and screws are implanted to keep them in place
- ❖ Diabetes mellitus and ankle fractures
 - ❖ Previous groups have shown increased complication rates
 - ❖ Infection, malunion, and impaired wound healing [5]
 - ❖ Goal of this study was to calculate the increased risk of readmission, reoperation, and mortality after ankle fracture ORIF in diabetic patients



Methods

A retrospective review of 17,464 patients who underwent ORIF for ankle fractures from 2006 to 2015 in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database was performed. 30-day postoperative unplanned readmission, unplanned reoperation, and mortality rates were compared in 2,044 patients with diabetes and 15,420 patients without diabetes. Adjusted odds ratios (OR) with a 95% confidence interval (CI) were calculated for each parameter.

American College of Surgeons
National Surgical Quality Improvement Program

Collect pre-operative and 30-day post-operative patient data

Compile de-identified patient data into national database

Analysis of patient outcomes, complication rates, and risk factors

Identify strategies for surgical quality improvement and patient care

Risk factors

- ❖ Diabetes mellitus
- ❖ Obesity
- ❖ Hypertension
- ❖ Tobacco use
- ❖ Malnutrition

Potential major complications

- ❖ Hospital readmission
- ❖ Infection
- ❖ Delayed healing
- ❖ Malunion/nonunion
- ❖ Reoperation
- ❖ Amputation
- ❖ Death

Results

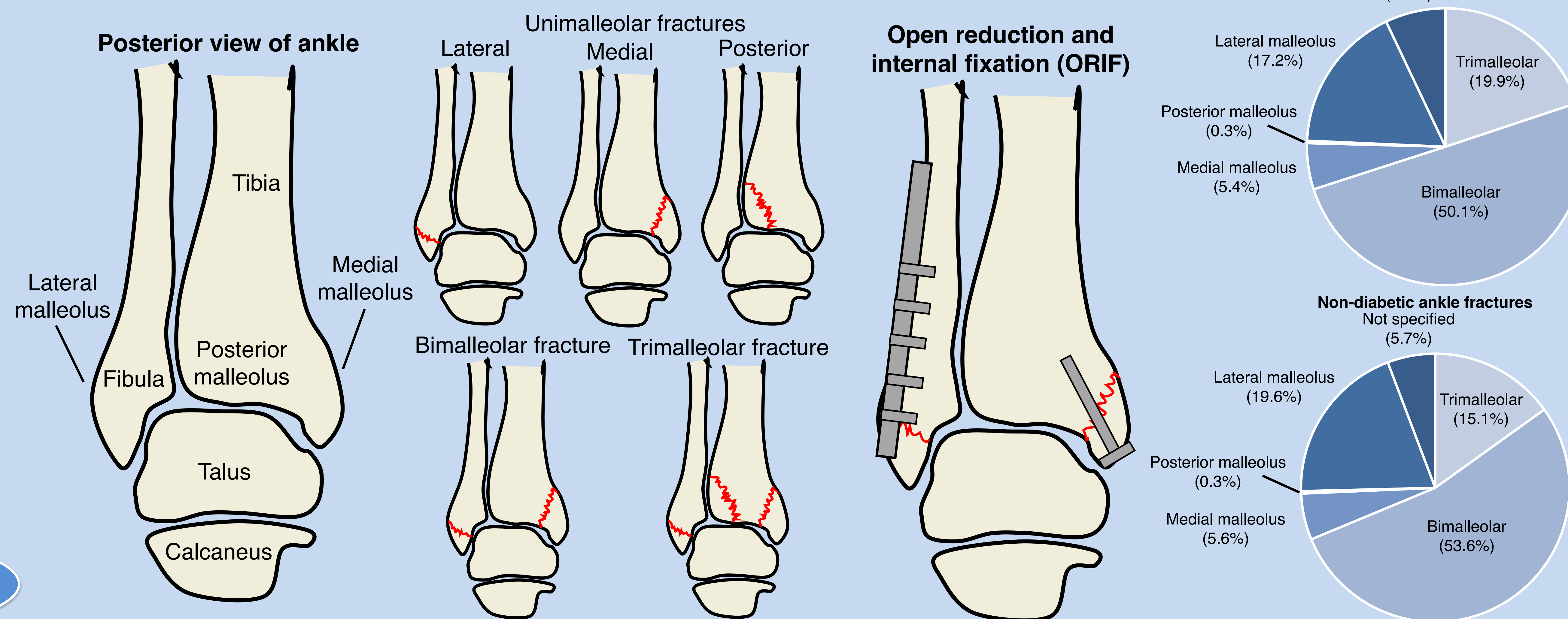


Table 1: Patient factors and pre-operative laboratory patient statistics

	Diabetic		Non-diabetic		P value
	Value	(IQR or %)	Value	(IQR or %)	
Patient factors					
Age, median, years	63	(55-72)	48	(33-61)	< 0.0001
Male gender, n (%)	730	(35.7)	3384	(38.9)	0.0094
Smoking (%)	361	(17.6)	2304	(26.4)	< 0.0001
Length of stay, median, days	2	(1-3)	1	(0-2)	< 0.0001
Hypertension (%)	1617	(79.2)	3970	(25.8)	< 0.0001
BMI	32.5	(26.6-39.5)	28.7	(25.1-33.3)	< 0.0001
Concurrent surgery (%)	248	(13.1)	1779	(12.8)	0.6756
Laboratory values					
Creatine	0.92	(0.74-1.22)	0.8	(0.70-0.99)	< 0.0001
BUN	18	(13-25)	14	(11-17)	< 0.0001
WBC	8.6	(7-10.7)	8.5	(6.9-10.5)	0.1215

Table 2: Odds ratios of diabetic vs non-diabetic

	Diabetic		Non-diabetic		Adjusted Odds Ratio	95% Conf. Interval	P value
	Value	(%)	Value	(%)			
Readmission	93	4.3	229	1.9	2.66	1.99-3.52	< 0.0001
Reoperation	48	3.0	114	0.9	2.76	1.91-3.92	< 0.0001
Death	15	0.7	32	0.4	2.34	1.19-4.44	0.0377

- ❖ Diabetes severe enough to require oral, non-insulin, or insulin therapy was documented in 11.7% (2,044) patients
- ❖ Diabetic patients had a higher median age, were more likely to be female, and less likely to smoke
- ❖ Diabetic patients were also more likely to be hypertensive, had a higher BMI, and longer median length of stay at the hospital
- ❖ There was no significant differences in the likelihood of concurrent surgeries or white blood cell levels between diabetic vs. non-diabetics
- ❖ Diabetic patients had higher median creatine and blood urea nitrogen (BUN) levels, though both were still within normal range

- ❖ After controlling for age differences, patients with diabetes mellitus have:
 - ❖ 2.66 times increased risk of readmission
 - ❖ 2.76 increased risk of unplanned reoperation related to the principal operative procedure
 - ❖ 2.34 times increased risk of mortality

Conclusions

Presence of diabetes mellitus increases the risk of unplanned readmission, unplanned reoperation, and mortality after ankle fracture ORIF. Further research in optimization of perioperative care for diabetic patients is crucial to reducing rates of complications and readmission. Large clinical databases including ACS-NSQIP should endeavor to collect more parameters on diabetic patients to facilitate these studies.

References: [1] Court-Brown CM et al. 2006 [2] Phillips WA et al. 1985 [3] Wukich DK et al. 2008 [4] Pott P et al. 2007 [5] Chaudhary SB et al. 2008

Acknowledgements: American College of Surgeons National Surgical Quality Improvement Program Database