

# A 13-Year Retrospective Analysis of an Admission Avoidance Strategy Using Intramuscular Antibiotics in Treating 'Borderline-Severe' Diabetic Foot Infections

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## Background

- Diabetic foot infection is one of the most common causes of acute hospital admission.
- Staphylococcus Aureus is the most common organism isolated from infected diabetes lesions.

2012 Guidelines by the Infectious Disease Society of America (ISDA) recommend hospitalisation for:

1. All patients with severe infection
2. Patients with moderate infection with complicating features
3. Patients that are unable to comply with outpatient therapy
4. Failing to improve with outpatient therapy

We found that there might be a subset of patients with moderate-severe whose condition were too severe for oral antibiotic treatment but equally might be able to avoid hospital admission.

In this study, we developed an admissions avoidance protocol to find a better treatment regime for this group of patients.

## Results

### Patient characteristics (N=143)

Age (years)	61.0 ±13.3	
Male	119 (83%)	
Female	24 (17%)	
Type 1	36 (25.2%)	
Type 2	106 (74.1%)	
Other	1 (0.7%)	
Insulin	81 (56.6%)	
Oral medication	38 (26.6%)	
Insulin and Oral medication	18 (12.6%)	
Diet controlled	6 (4.2%)	
HbA <sub>1c</sub> average (mmol/mol)	75 ±24	
IM antibiotics duration (days) **	5.5 (6.0)	
	Present	Absent
Foot pulses	109 (76%)	34 (24%)
Neuropathy	120 (84%)	23 (16%)

Mean ± SD for continuous variables, and N (%) for categorical variables.

\*\* for Median (IQR)

## Methodology

### Admissions avoidance protocol

Using the ISDA Diabetes Infection Classification system for grading, we defined borderline-severe as:



- Cellulitis > 2cm around the ulcer.
- Foot failing to respond to oral antibiotics alone.
- Not systemically unwell.

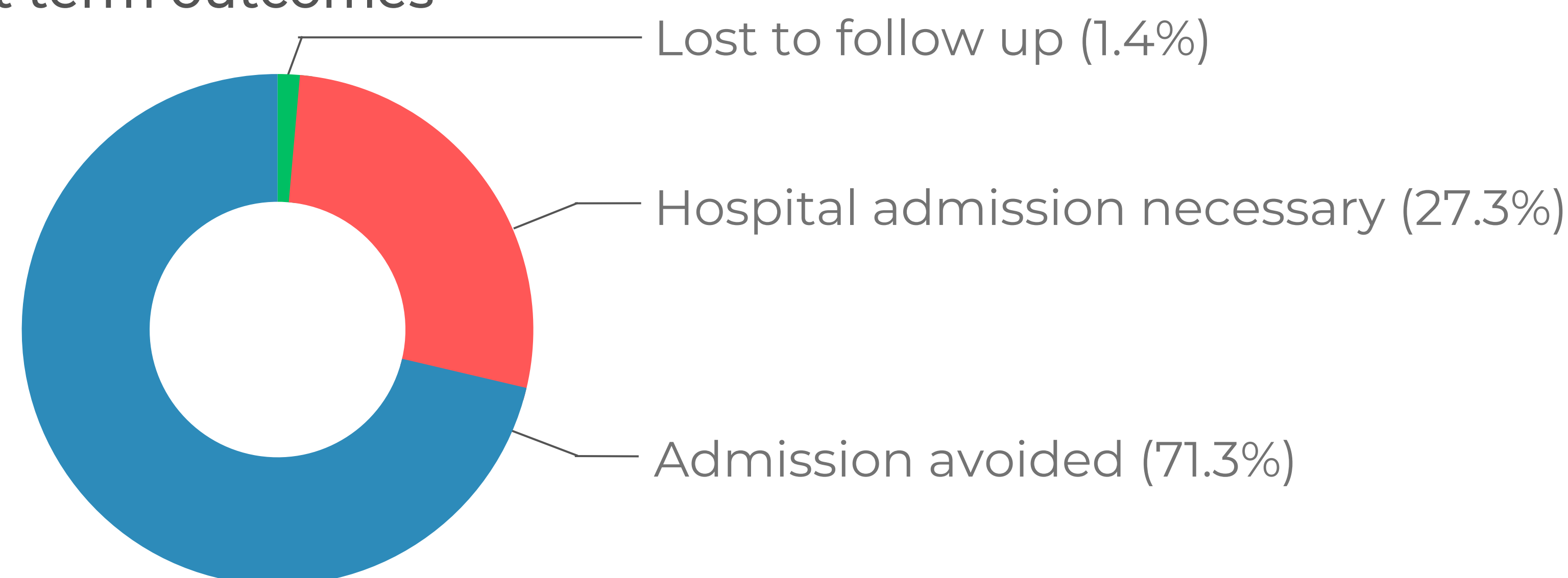
### Patients in this category received:



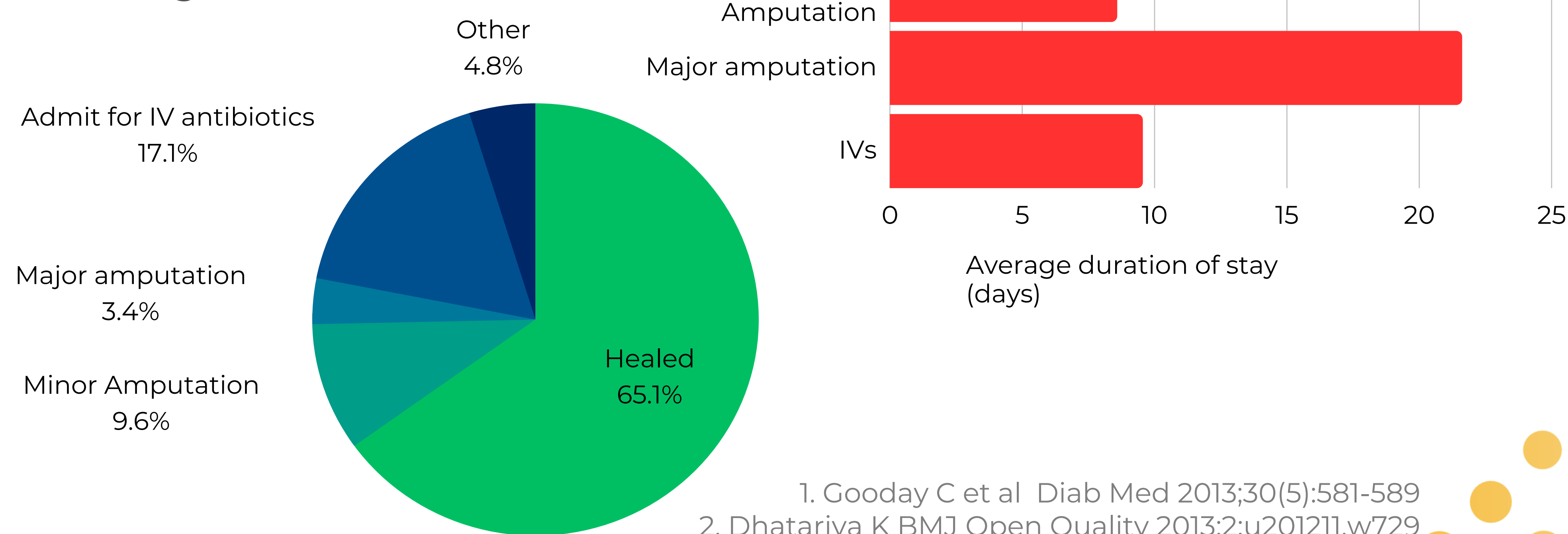
IM Ceftriaxone 1g or 400mg of Teicoplanin  
+  
PO Ciprofloxacin 500mg twice daily and  
Metronidazole 400mg four times daily

- 122 patients (accounting for 143 episodes) were identified in clinic and were treated for a borderline-severe infection between Jan 2009 and Apr 2022.
- They were reviewed 2-3 days after starting IM therapy and regularly reviewed throughout treatment and after treatment until Apr 2022.
- Patients were excluded if they did not complete a full course of IM therapy.
- Data was collected on hospitalisation rates, healing following IM treatment and long-term overall outcomes.

### Short term outcomes



### Long term outcomes



1. Gooday C et al Diab Med 2013;30(5):581-589

2. Dhatariya K BMJ Open Quality 2013;2:u201211.w729

3. Lipsky BE et al Open Forum Infectious Diseases 2017;4(91):ofw255

## Conclusion

- Admission avoidance strategies are increasingly important in reducing the pressure on hospital beds.
- By identifying patients who fall under the 'borderline-severe' category, we were able to reduce hospital admissions by 71.3%. Of those that received the protocol, 65.1% of patient's ulcers healed fully.
- Like others, our hospital increasingly uses outpatient intravenous antibiotic services, but that has its own pressures. We now successfully use either the IV or IM administration to treat borderline-severe diabetic foot infections depending on the capacity of either service.