

## Vascular Access in a Frail Haemodialysis Population

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### Introduction

Current guidelines recommend arteriovenous (AV) access over central venous catheter (CVC) access in haemodialysis (HD) populations. The limitations of this approach are increasingly recognised, and are particularly relevant for frail, co-morbid patients with limited life expectancy. In such patients AV access may incur more invasive procedures, whereas CVC access may incur heightened risks of infection. This study aimed to evaluate the association between HD access modality and access complications, hospitalisation and mortality in a cohort of frail HD patients.

### Method

We performed retrospective analysis of prospectively recorded data from the Strathclyde Electronic Renal Patient Record from 01/10/2017 to 21/09/2019. HD patients with a Rockwood clinical frailty scale (CFS)  $\geq 6$  were identified with baseline demographic data recorded from the first CFS  $\geq 6$  date to census date 21/09/19 or death. We recorded the first vascular access modality at study inception and the modality at the time of census or death. Episodes of TCVC associated sepsis were determined using both clinical diagnosis from patient case records and positive blood cultures.

### Results

138 patients were identified with CFS  $\geq 6$ . Median age was 69 years and 51% were female. Median follow-up was 1.1 years with 48871 observed HD days. 51% patients were deceased at census.

Table 1 illustrates vascular access modality at initial CFS. CVC accounted for the greatest proportion of dialysis access days (52.4%) compared to AVF (38.7%) and AVG (8.9 %).

There was no significant difference in mortality between vascular access modalities over the follow-up period (47.5% CVC; 54.3% AVF; 58.3% AVG,  $p=0.65$ ).

In total, 5134 HD exposed days (10.5%) were spent as an inpatient, of which 97% were unscheduled. Both AVG (141/1000 HD days) and CVC (109/1000 HD days) were associated with more inpatient bed days than AVF (95/1000 HD days) ( $p<0.0001$ ). Patients who started with CVC and transitioned to AV access had a rate of 65/1000 HD days. This was lower than those who remained on CVC throughout ( $p<0.0001$ ).

There were 24 CVC associated sepsis episodes during follow-up, a rate of 0.9/1000 HD days. Rates of CVC associated sepsis were similar between CFS 6 (0.8/1000 HD days) and CFS 7 (1.0/1000 HD days) ( $p=0.52$ ). The CVC associated staphylococcus aureus bacteraemia (SAB) rate for the overall population was 0.2/1000 HD days. AVG sepsis occurred at a rate of 0.5/1000 HD days and there were no incidences of AVF sepsis in those who continued with AVF throughout the follow-up period.

### Conclusion

CVC was the most prevalent access modality in this frail HD population. Rates of CVC associated sepsis and SAB were similar to published bloodstream infection rates and existing local data<sup>1</sup>. Although absolute events were low, increasing frailty from CFS 6 “moderately frail” to CFS 7 “severely frail” did not appear to influence CVC associated sepsis rates. Patients with CVC and AVG had greater inpatient bed days than those

with AVF. Transitioning from CVC to AV access reduced inpatient bed days. However, the choice of vascular access modality did not influence mortality overall.