

1 Million Patient Encounters

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1 Million Cases

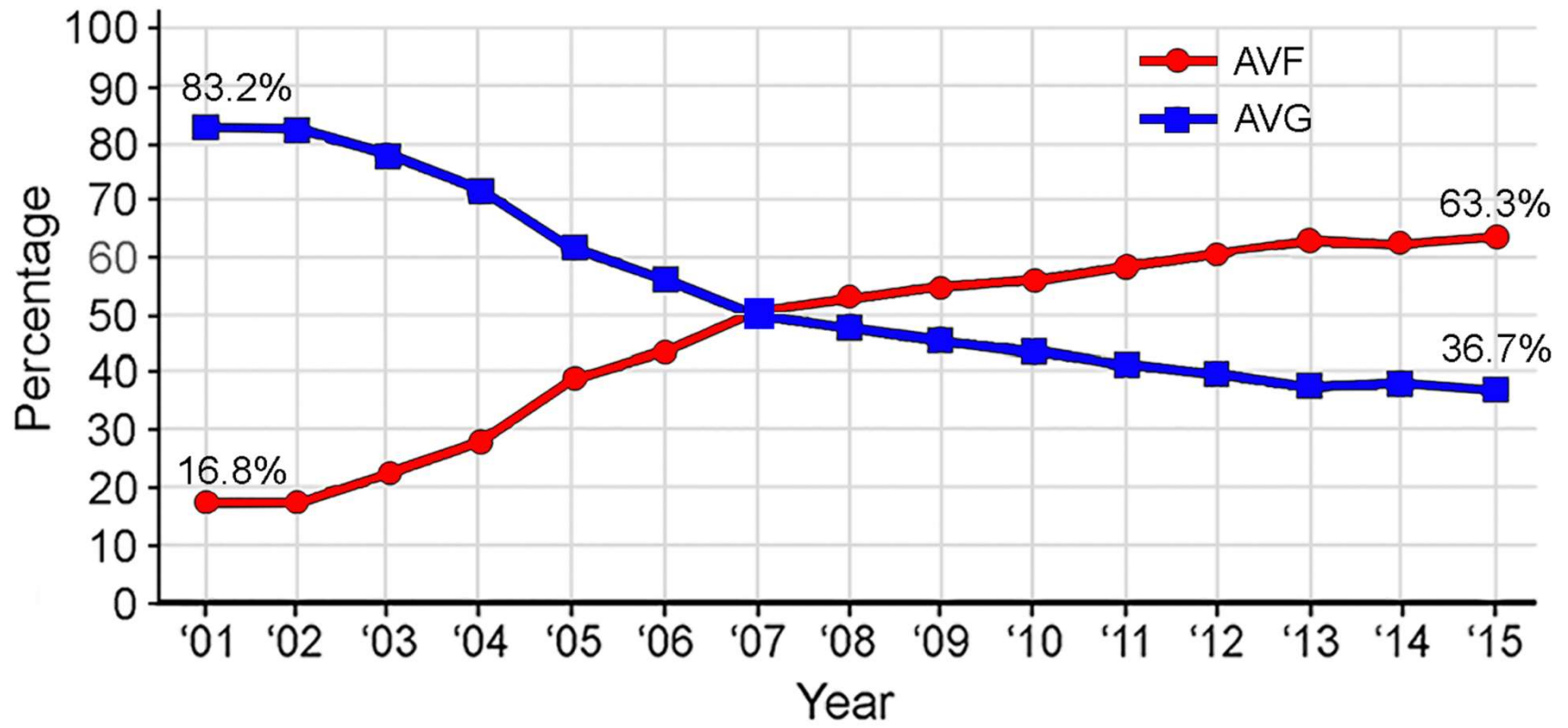
- Over the past 15 years, major changes in the dialysis access profile for both incident and prevalent patients have occurred
- The question is – how have these changes affected dialysis access procedures being performed in the access center?

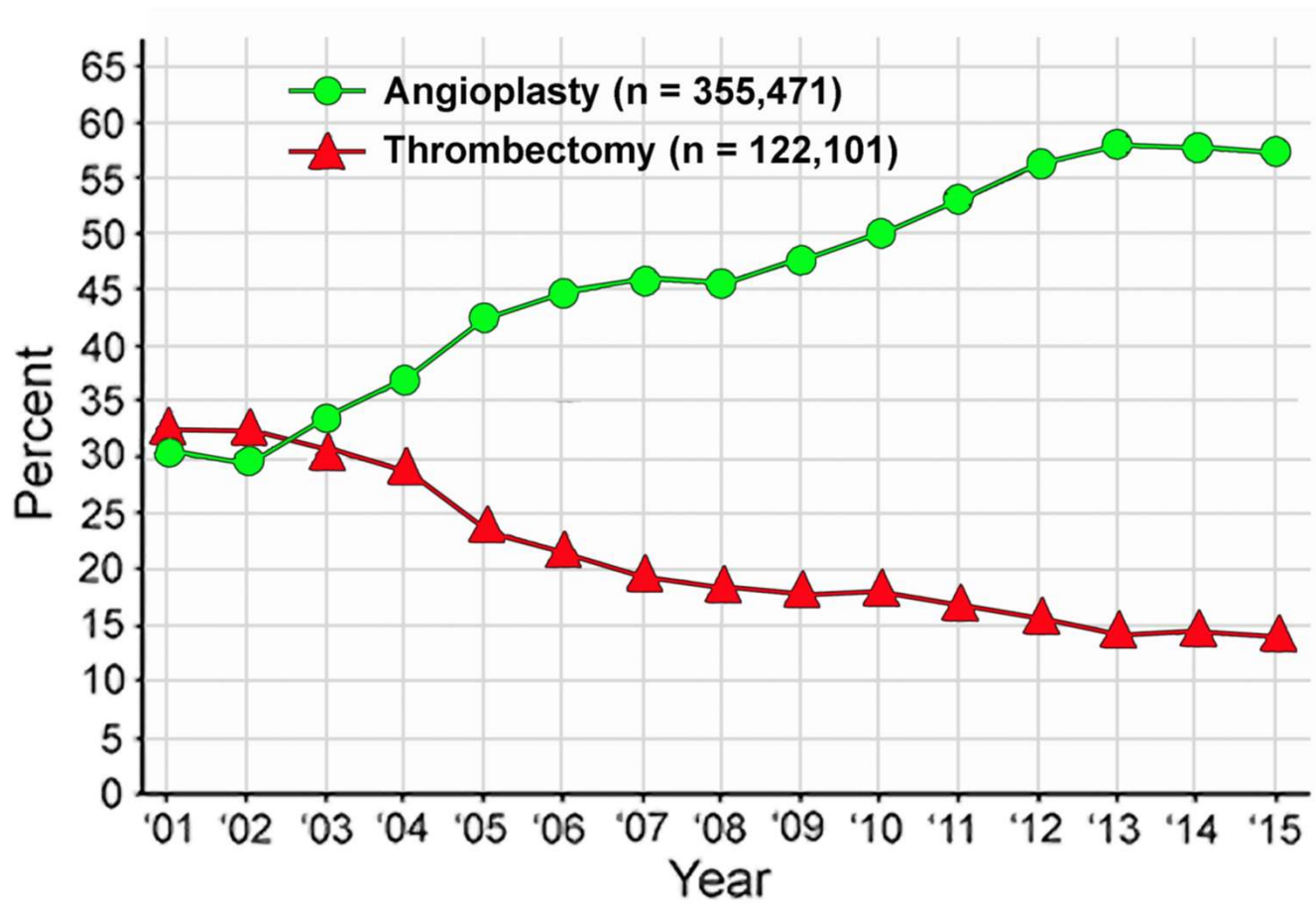
Dialysis Access Procedure Profile

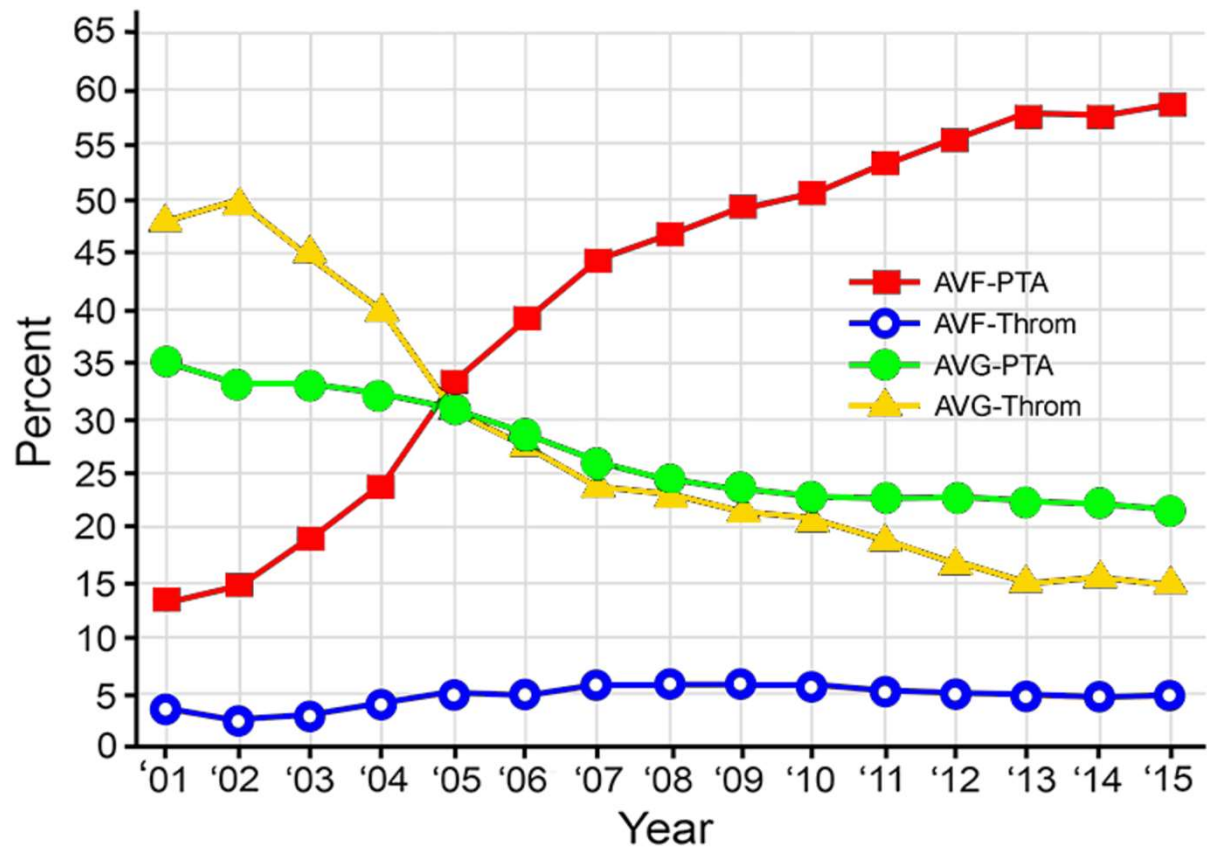
- Between 2001 and 2015 LifeLine Access Centers had 1 million patient encounters
- This included 689,676 dialysis vascular access procedures
 - 477,679 (69.14% of total) were arteriovenous access procedures
 - 265,201 were AVF procedures
 - 212,478 were AVG procedures
 - 213,236 (30.86%) tunneled dialysis catheter procedures

Arteriovenous Access

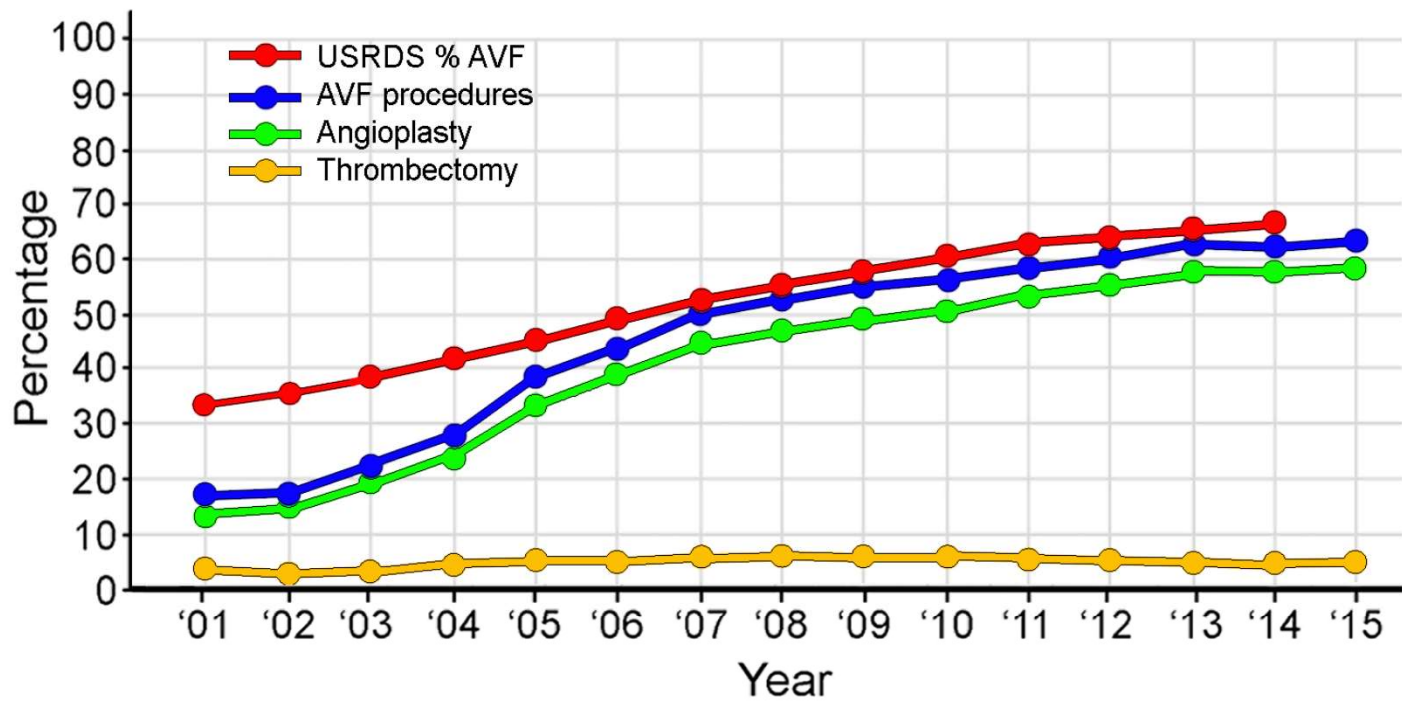
Numbers will represent percent of total



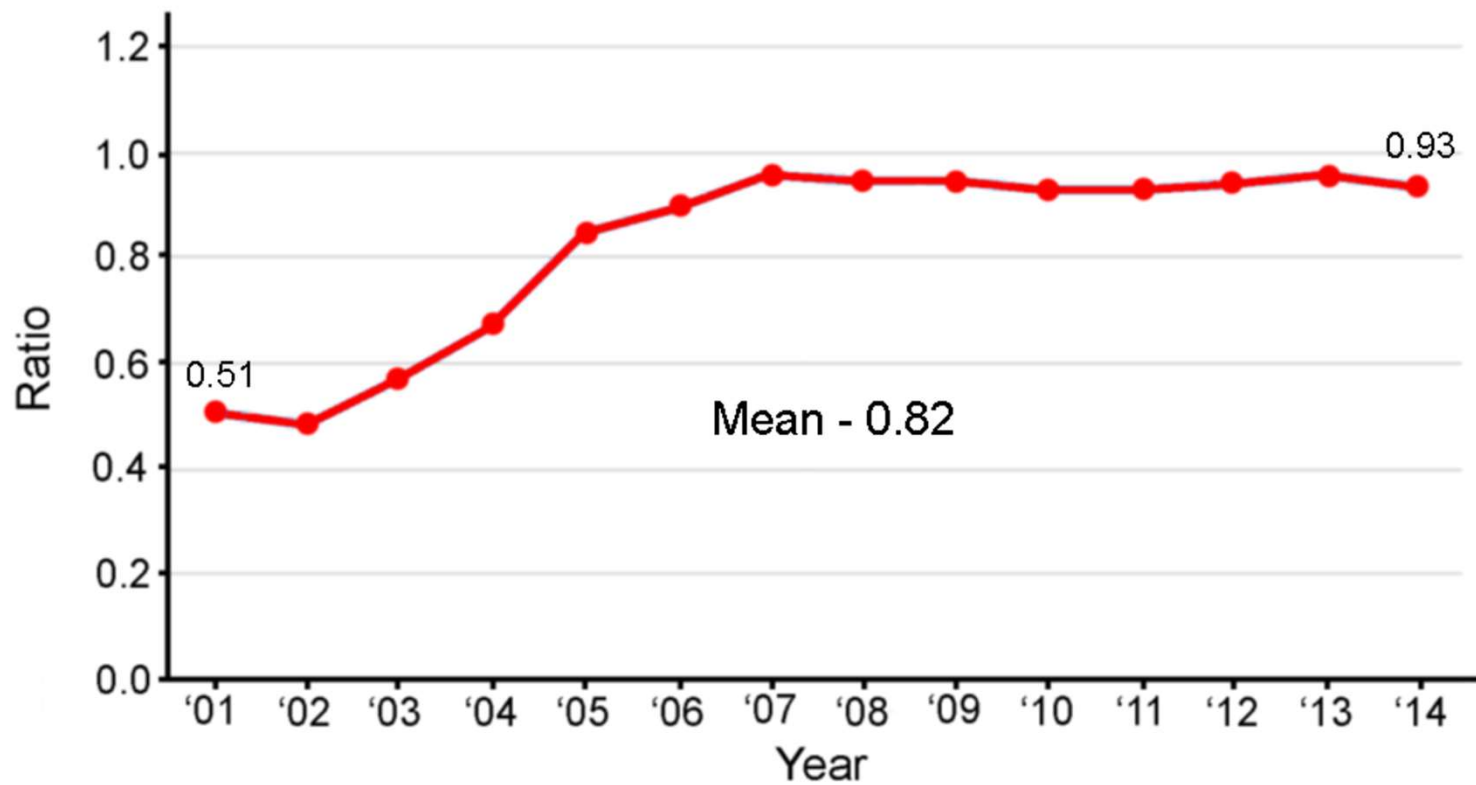




AVF



Ratio of AVF Procedures to Numbers



Changes in AVF Procedures

- It was anticipated that with increasing numbers of AVFs, procedures performed would decrease – this did not occur
- The major AVF change was in increasing numbers of angioplasties
 - Thrombectomy percentages increase slightly, but overall was relatively stable
- The prevalence of AVFs in the dialysis population increased 2-fold
- AVF angioplasty increased 4-fold
- Overall, 2/3 of all angioplasties were performed on AVFs
- The question arises – why did this occur

Nature of AVFs

- It is said that AVFs are associated with a lower incidence of stenosis, thrombosis and infection
- This statement is only partially correct
- It is based upon AVFs that are clinically functional
- When primary failures are included, the primary patency of AVFs and AVGs is comparable for the first year following creation because of AVF failure to mature (FTM)

Failure to Mature

- FTM is a major problem
- FTM as an indication for angioplasty - mean incidence of 12.62%
- Most cases can be salvaged with angioplasty, but is procedure intensive
- Many cases require more than one treatment, repeat treatment are frequently not listed as FTM
- Salvaged FTM cases require more angioplasty treatments to maintain patency than cases that mature de novo

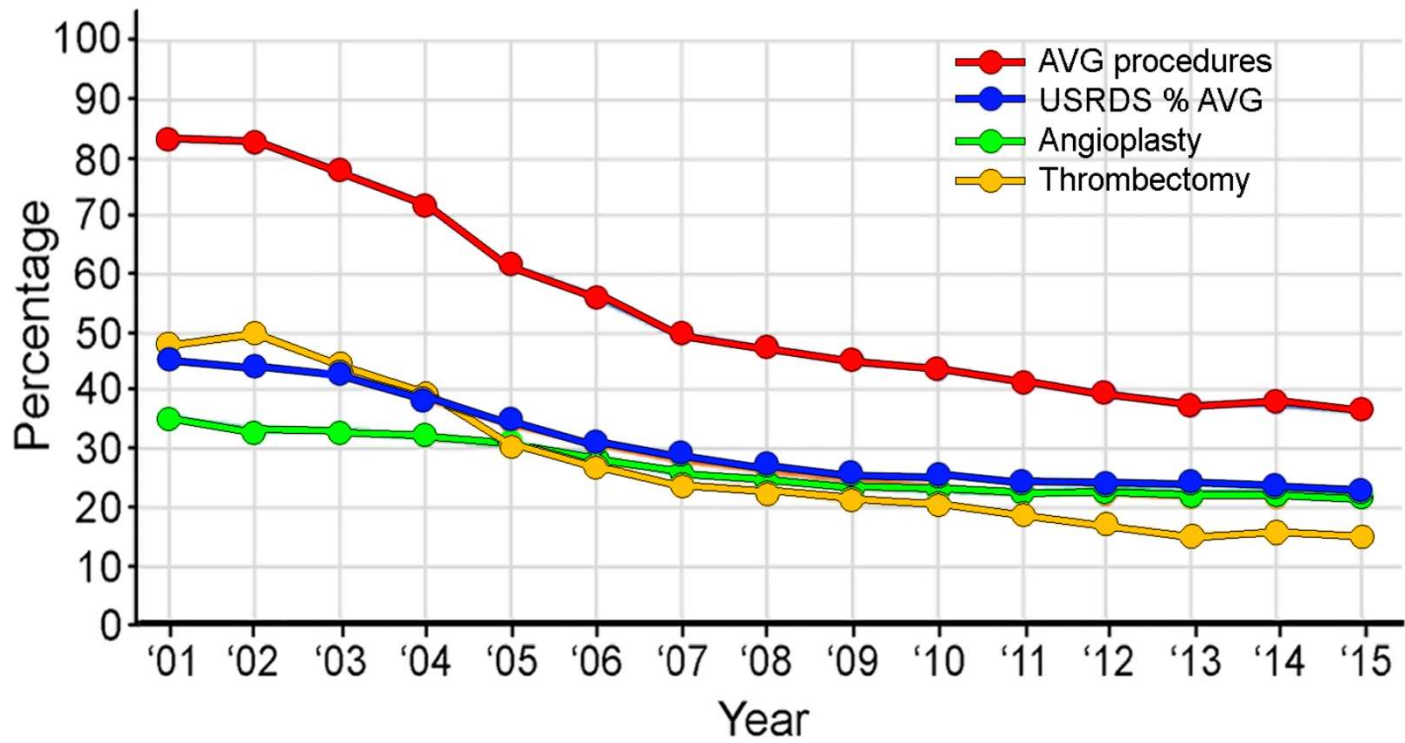
Prolonged Catheter Use

- Central venous catheters are major because of central venous stenosis
- incidence is directly proportional to duration of catheter use
- Central venous stenosis lesions tend to be resistant to therapy and recurrent by nature requiring repetitive angioplasty

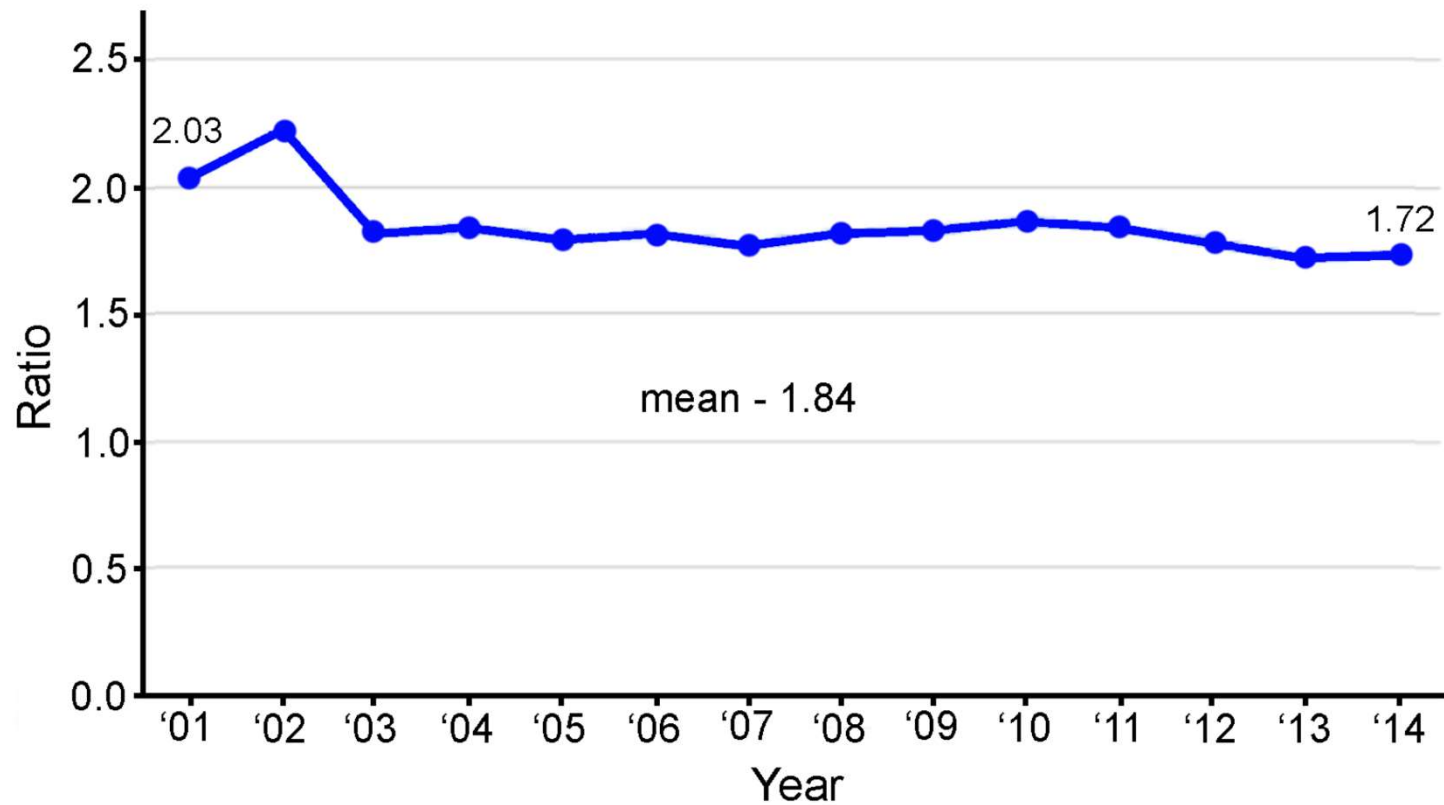
Increased Numbers of Angioplasty

- Both FTM and TDC usage in incident patients result in situations that are angioplasty intensive
- It is very likely that these two issues account for the disproportionate number of angioplasties that were observed

AVG

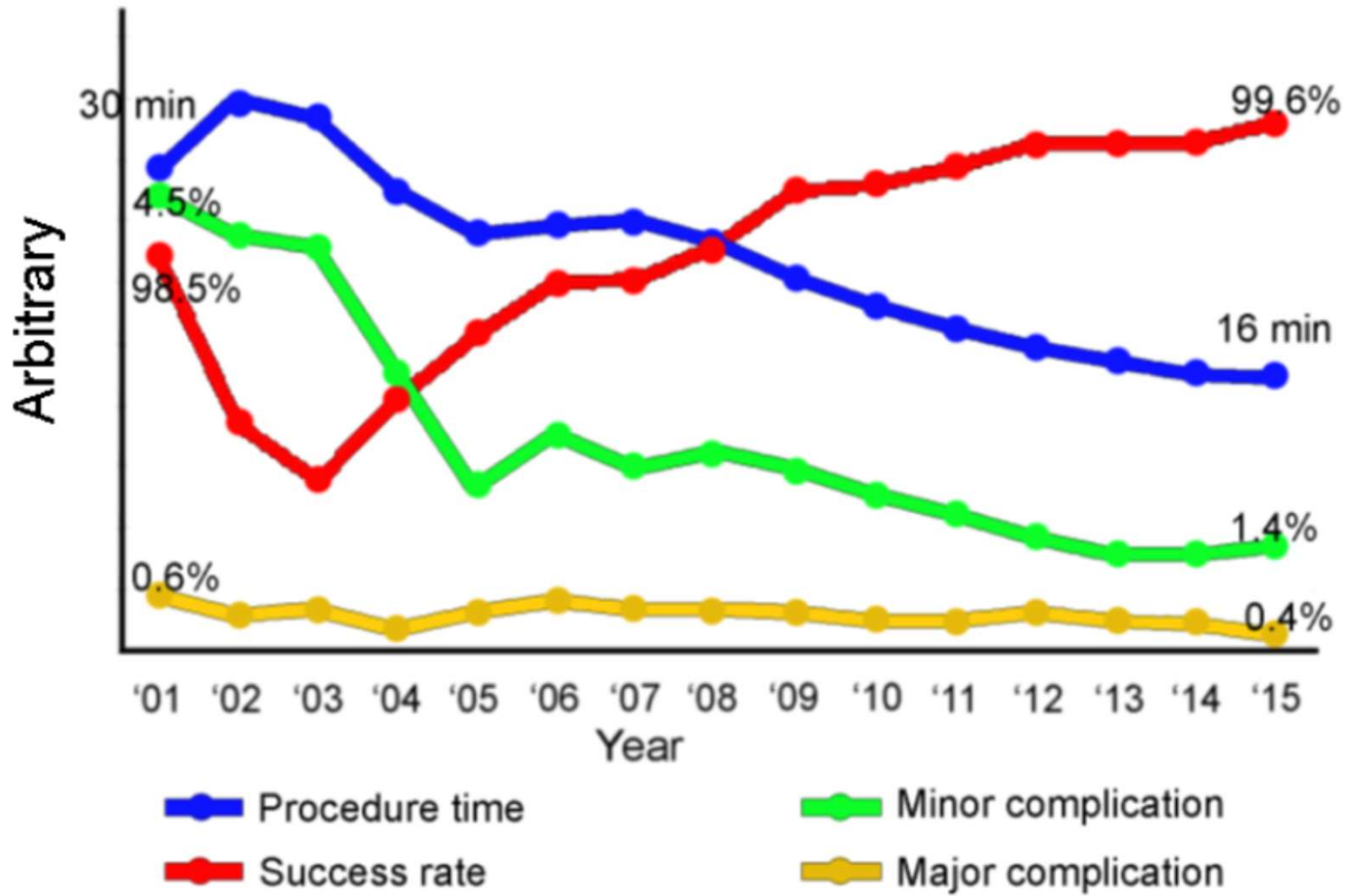


Ratio of AVG Procedures to Numbers

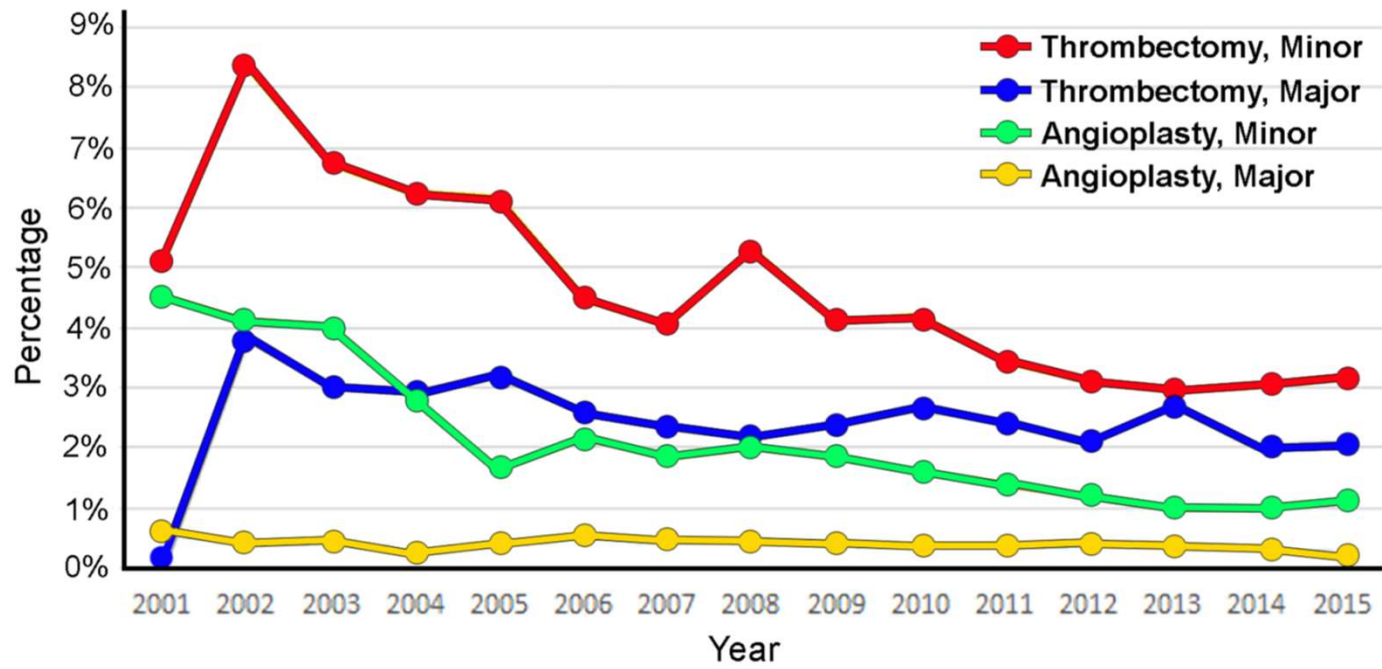


Arteriovenous Metrics

AVF PTA Metrics



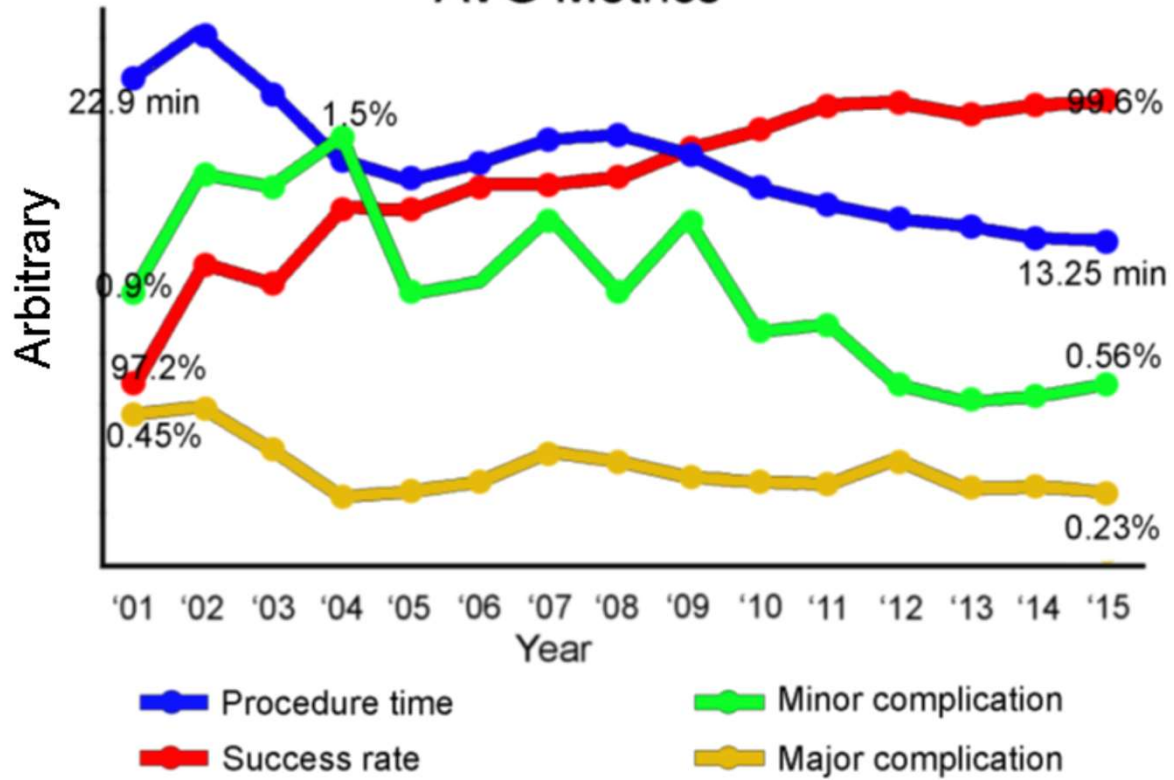
Fistula Complications



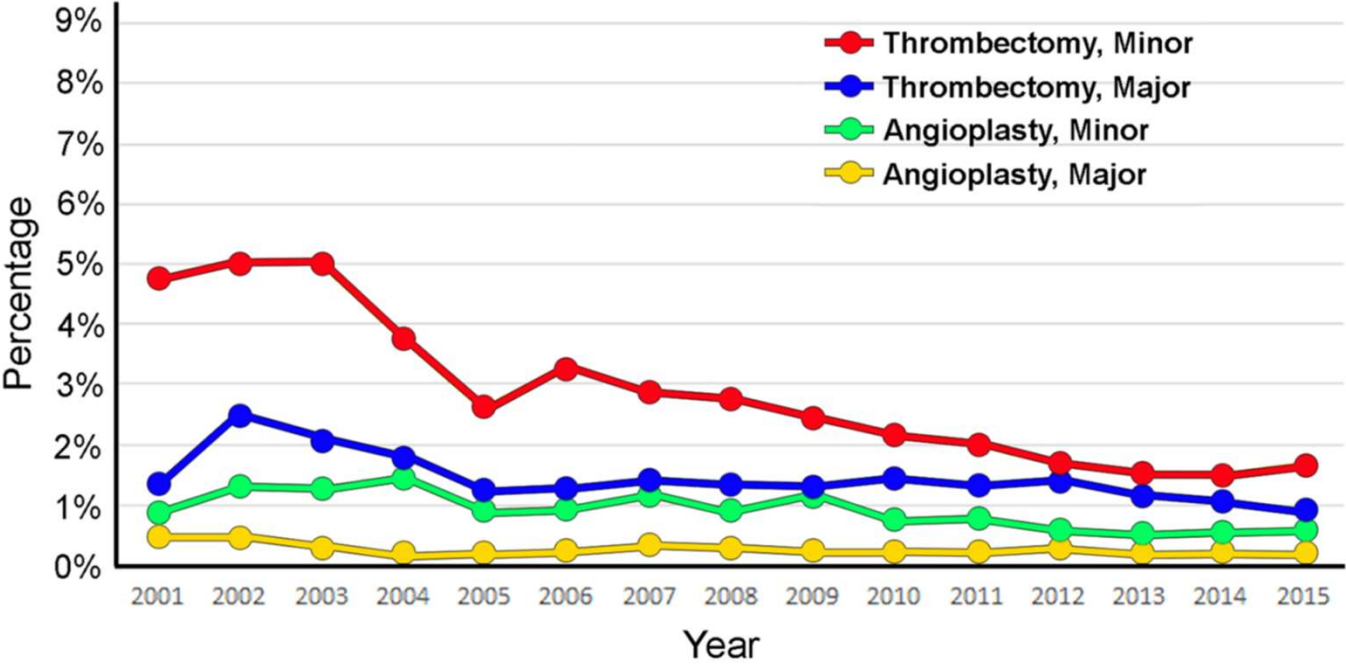
Types of Complications

- Most common complication - venous rupture
 - 77.68% of the total PTA complications
 - 74.18% of the total thrombectomy complications
- Most were Grade I extravasation, 60.16% and 49.48%
- 28 (0.011%) PTA and 10 (0.004%) thrombectomy cases were lost following a Grade III extravasation
- Next infrequency was arterial embolization representing 0.26% of PTA complications and 2.89% of thrombectomy complications

AVG Metrics



Graft Complications



Types of Complications

- Most common complication was venous rupture
 - 63.53% of PTAs and 58.05% of thrombectomies
- Most in both PTA and thrombectomy were Grade I extravasation, 48.01% and 40.56%, respectively
- 16 AVG-PTA (0.0140%) were lost following a Grade III extravasation
- Second in frequency was arterial embolization representing 0.08% of PTA complications and 9.14% of thrombectomy complications

Conclusions

- The profile of problems presenting our access centers has been materially affected by changes in the overall vascular access profile of the US dialysis patient population
- The ratio of AVF numbers to procedures performed has not been what was expected – disproportionate increase in angioplasties
- The ratio of AVG numbers to procedures performed has been essentially what was expected

- Changes occurring in arteriovenous access have increased the level of complexity of the procedures performed
- Despite the increased complexity evidence indicate that freestanding, dedicated dialysis access centers provide effective, efficient and safe medical care