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The Cost of an Access Reversion in a Value-Based World

The nephrology community is very aware that vascular access complications are expensive, but with the bulk of the costs being absorbed by the payer, it has not been a major concern for the provider community. However, as Value-Based Care (VBC) programs make their way into dialysis, understanding the true costs of access complications becomes important for structuring and justifying policies and programs for vascular access care.

Unlike many of the other co-morbid issues that ESRD patients face, most vascular access complications such as thrombosis can be averted by making a referral for an intervention. While every AV access will eventually fail, the most recent KDOQI Guidelines[1] recommends referral of clinically significant stenosis for preventive treatment to prolong access function for as long as possible[2]. Given that most of the costs associated with access complications occur when a thrombectomy is unsuccessful and the patient reverts to a catheter, it follows that reducing the incidence of thrombosis will reduce costs related to access complications. But what are those costs under a VBC program?

Our analysis shows that the average cost of a reversion under VBC is $26,405. Given that Vasc-Alert has a sensitivity of 92% and a specificity of 74%[3], the implementation of a vascular access care program that includes the Vasc-Alert surveillance service should substantially reduce the number of patients that suffer an access reversion.

Costs to the facility[4]**:** (missed Txs and CVC use)	$ 3,910
Cost of failed thrombectomy procedure[7]:	$ 6,919
Resulting access: 40% of reversions[4] will get a new AV access	$ 4,263
Failure rate for new fistula placements at 30%[9]	$ 3,197
Resulting access: 27% return to original access[4] at $540 (cost to remove CVC)	$ 146
Exposure to increased morbidity while on catheter 5 months[9]	$ 7,970
Cost per reversion	$26,405

Note: Each VBC program has their own historic and current costs associated with access reversion. We suggest that participating practices use their own data if available to derive a more specific cost-benefit analysis.

The following outlines the major cost components associated with a reversion in a risk-based environment.

Costs to the facility: An internal analysis of 1,811 reversions followed for 2 years produced the following averages[4].

- Missed treatments: 5.6 missed Txs at a cost of $350[5] = $1,960
- Average Txs on a catheter: 65 treatments (5 months) at an added cost of $30/Tx[6] = $1,950
- Total cost per reversion: $3,910

[1] Lok CE, et al. KDOQI Clinical Practice Guideline for Vascular Access: 2019 Update. Am J Kidney Dis. 2020 Apr
[2] Beathard G. Techniques for angioplasty of the arteriovenous hemodialysis access:
[3] Weighted average of 6 Vasc-Alert Efficacy Studies, available on request.
[4] Summary of internal analysis of 1,811 reversions available on request.
[5] Published average revenue per treatment in SEC filings of major providers.
[6] Catheter costs: components $10, drugs $12, extra nursing time $8.

Cost of failed thrombectomy: The weighted average of the cost of the procedure by venue: 51% performed in a hospital at $11,000, 7% in an ASC at $6,100, and 42% in an access center at $2,100 = $6,919[7]

Resulting access: The two-year analysis of 1,811 reversions[4] also indicated whether the patient:

- Returned to their original access (same location, and type of access) 27%,
- Received a new AV access (new location and/or type of access) 40%,
- Or remained on a catheter 33%.

Cost of a new AV access is $10,658[8]. Given that 40% percent of patients who have a reversion receive a new AV access, the proportional cost is $4,263.

Failure rate for new fistula placements: It is well documented that upwards of 45% of new fistula placements fail to mature[9]. This analysis assums a 30% failure rate resulting in a proportional cost of $3,197.

Exposure to increased morbidity: Patients on a catheter are at a higher risk of morbidity. A 2017 study[10] indicated that patients using an AV access cost $9,580 a year whereas catheter patients had costs of $28,709. The difference is $19,129. The average reversion patient remains on a catheter for 5 months, resulting in increased exposure to hospitalization and other health costs of $7,970 (5/12ths of a year).

[7] Costs from current CPT codes and percentage of procedures from CMS volume tables.
[8] Sorber R, et al. Quantifying the Costs of Creating and Maintaining Hemodialysis Access in An All-Payer Rate-Controlled Health System. Ann Vasc Surg. 2021 Oct. (Creation and maintenance of a new AV access in first year: $10,658.)
[9] Woodside KJ, Bell S, Mukhopadhyay P, et al. Arteriovenous fistula maturation in prevalent hemodialysis patients in the United States: a national study. Am J Kidney Dis. 2018
[10] Al-Balas, Allon M., et al , The Clinical and Economic Effect of Vascular Access Selection in Patients Initiating Hemodialysis with a Catheter., J Am Soc Nephrol. 2017