

BACKGROUND

Frequent dialysis has consistently improved patient outcomes. Professional staffing of dialysis affects patient care quality and safety. Requirements for physician presence during dialysis and for nursing staff levels are highly variable worldwide. We have set up a 24-stations in-center short daily hemodialysis (SDHD) program whose all day long care is provided by two on-site nephrologists, certified nurses, renal dietitians and psychologists with full time dedication.

AIMS

This report outlines the impact of 10 years of combining daily hemodialysis with selected clinical staffing on patient outcomes.

METHODS

Nephrologist schedule, patient to staff ratios, adverse events rates (hypotension, medication errors, patient falls), vascular access profile (type, infection rates), patient compliance (missed treatment rate), hospitalization (days per patient-year [pp-y]), cumulative survival and kidney transplantation rates were assessed in 200 private-insured -67 (122M/78F; mean age 58.0±18.5yrs, 18-96) receiving in-center SDHD (6-7 x/wk; lasting 115.4±11.2min, 90-180; ultrapure dialysate and single-use high-flux dialyzer).

RESULTS

From June 2009 to May 2019 four out 5 nephrologists shared equitable schedule 7 days/wk, each one prescribing up to 24 patients in 2 parallel and 2 sequential 6-hour workday. In 2009 we stopped hiring technicians and moved to 100% nurses staffing, reaching 21 full time certified nurses (up to 3:1 ratio). Additionally, 2 dietitians and 2 psychologists assist 80 current patients (40:1 ratios). In 2018 symptomatic hypotension occurred in 3% of 20,035 treatments, medication errors in 17 occasions (none critical) and no patients fell in the unit. Over the 10-year study period, arteriovenous fistula was used in 53% and tunneled catheter in 47% of prevalent patients, with bacteremia rate of 0.27 and 0.50 events per 1,000 days. Missed treatment rate was 1.49% or 4.6 days pp-y. Hospital length of stay was 2.9 days pp-y, 5-year survival was 64% and average kidney transplantation rate was 7.5%. Duplicating nephrologist presence and replacing technicians with certified nurses doubled labor costs, largely offset by higher productivity (five 2-hour shifts/day) and longer dialysis vintage.

CONCLUSION

This intensive dialysis modality delivered by a first-rate clinical staffing represents an unparalleled approach toward an optimal treatment.

DISCUSSION

Dialysis comparisons across different dialysis programs help us to explore factors that contribute to the wide discrepancies in their outcomes.

An ideal dialysis prescription should provide the means to reduce uremic *millieu*, remove fluid excess and replace erythropoietin and vitamin D in a physiological and safe manner. Moreover, it must lead to full rehabilitation, so much so that quality of life and survival of dialysis patients should approach those of general population.

High-frequency hemodialysis delivered by a multiprofessional exclusive staffing has allowed our patient outcomes to far exceed those observed in conventional dialysis practices.

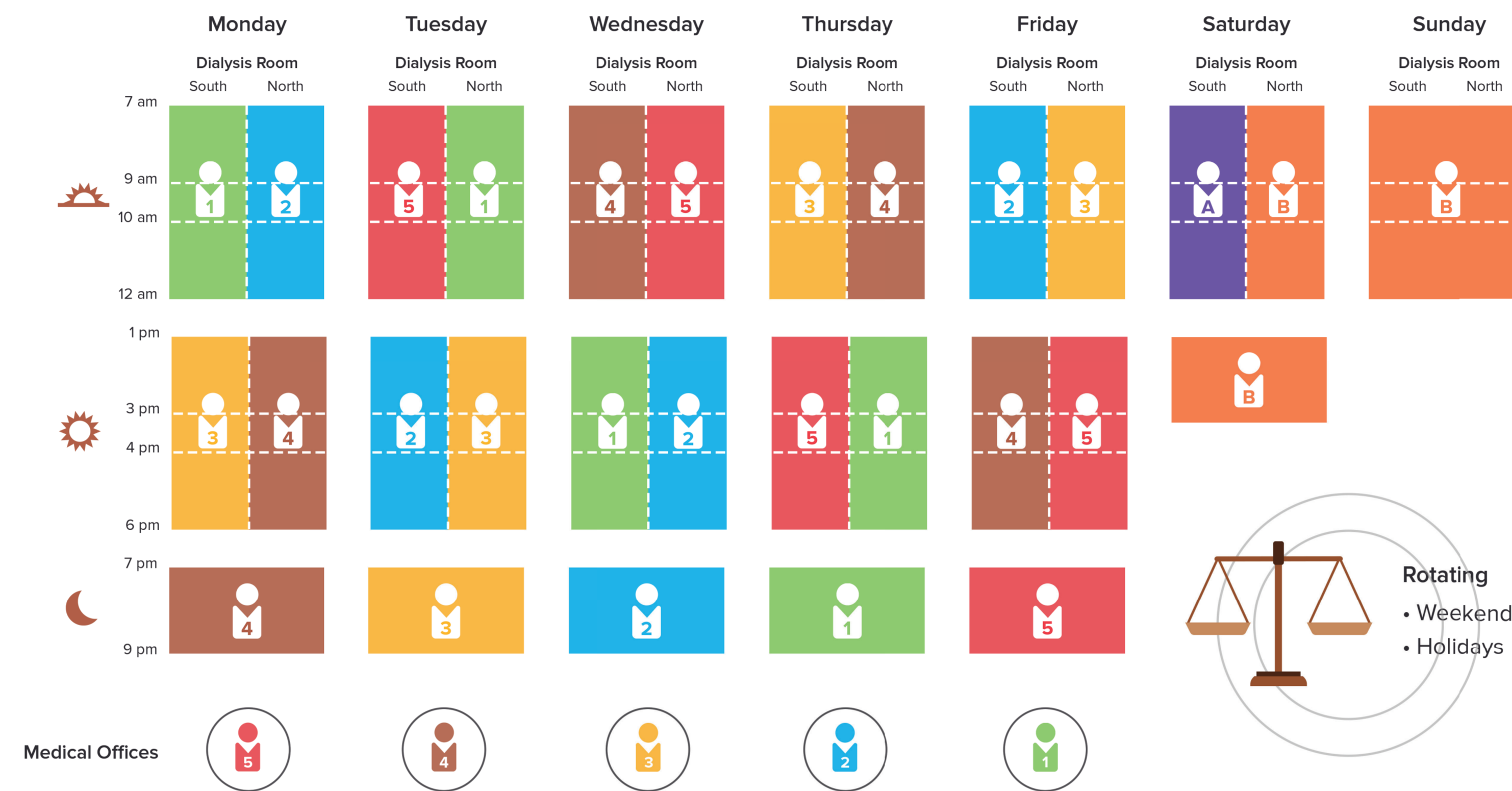
Indeed, by treating and caring daily for dialysis patients, in a consistent and comprehensive way, we've matched their life expectancy to the surrounding general population (average age at death: 75.8 years).

Thus, instead of being called "die-alysis", this intensive high-quality dialysis could more appropriately be renamed to "live-alysis".

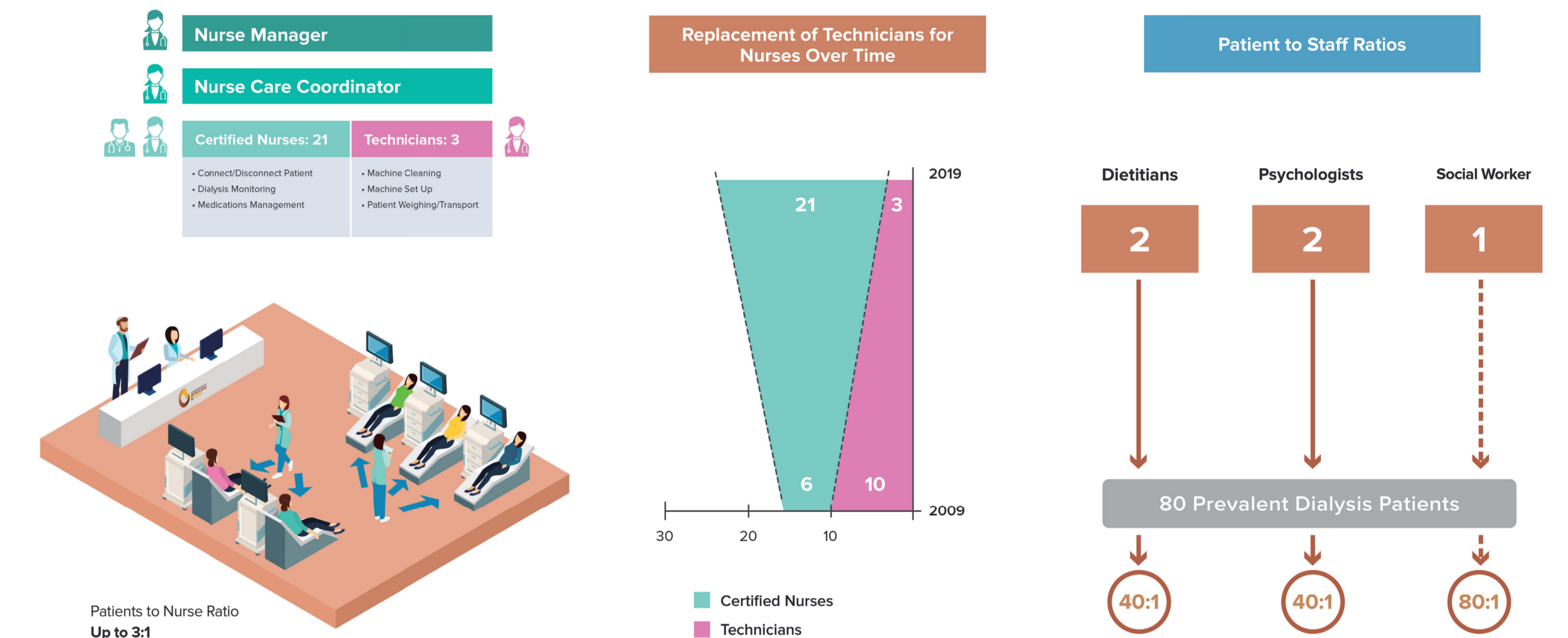
10-YEAR OBSERVATIONS OF 200 PATIENTS ON IN-CENTER SHORT DAILY HEMODIALYSIS

NEPHROLOGISTS SCHEDULE

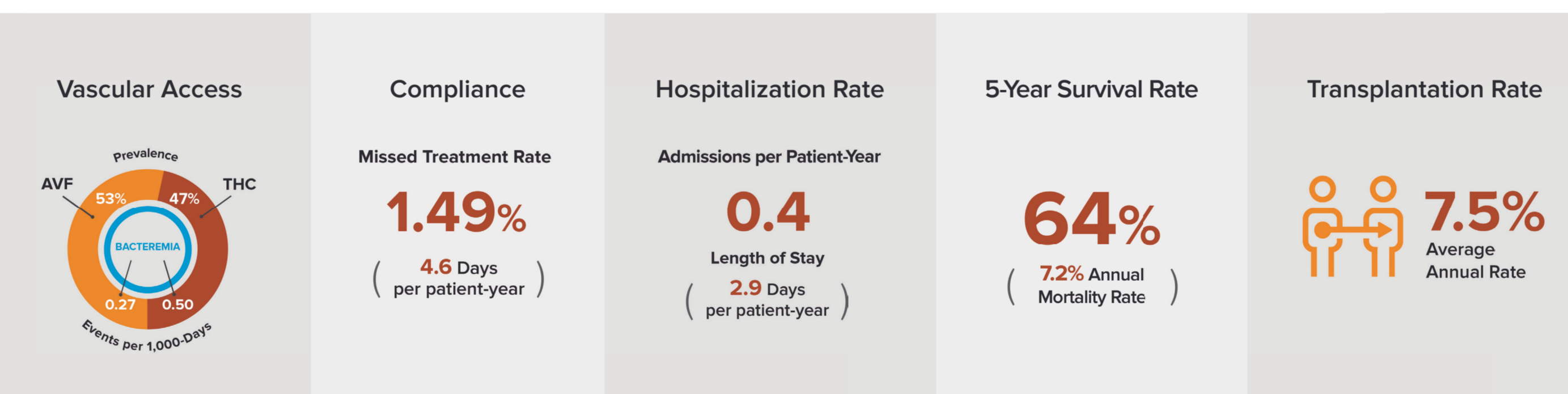
Extensive, Reciprocal and Equitable



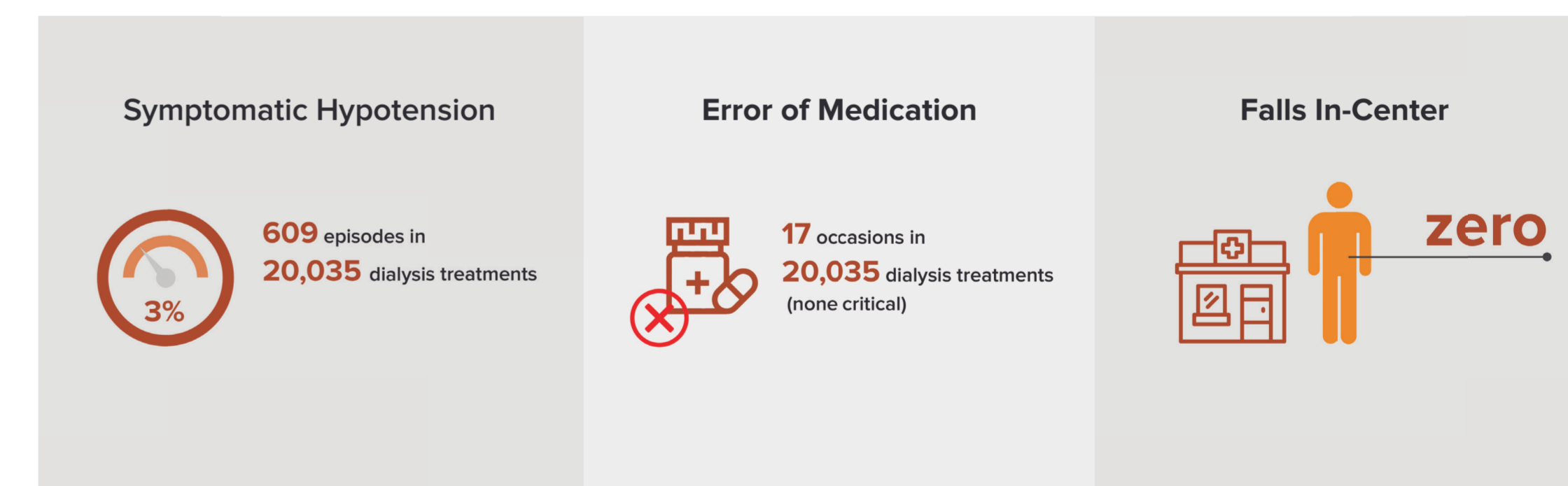
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CLINICAL PERFORMANCE MEASURES AND OUTCOMES



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Appendix

CBN&D Dialysis Patients

Average Age at Death

75.8 years

2009

2019

Brazil General Population

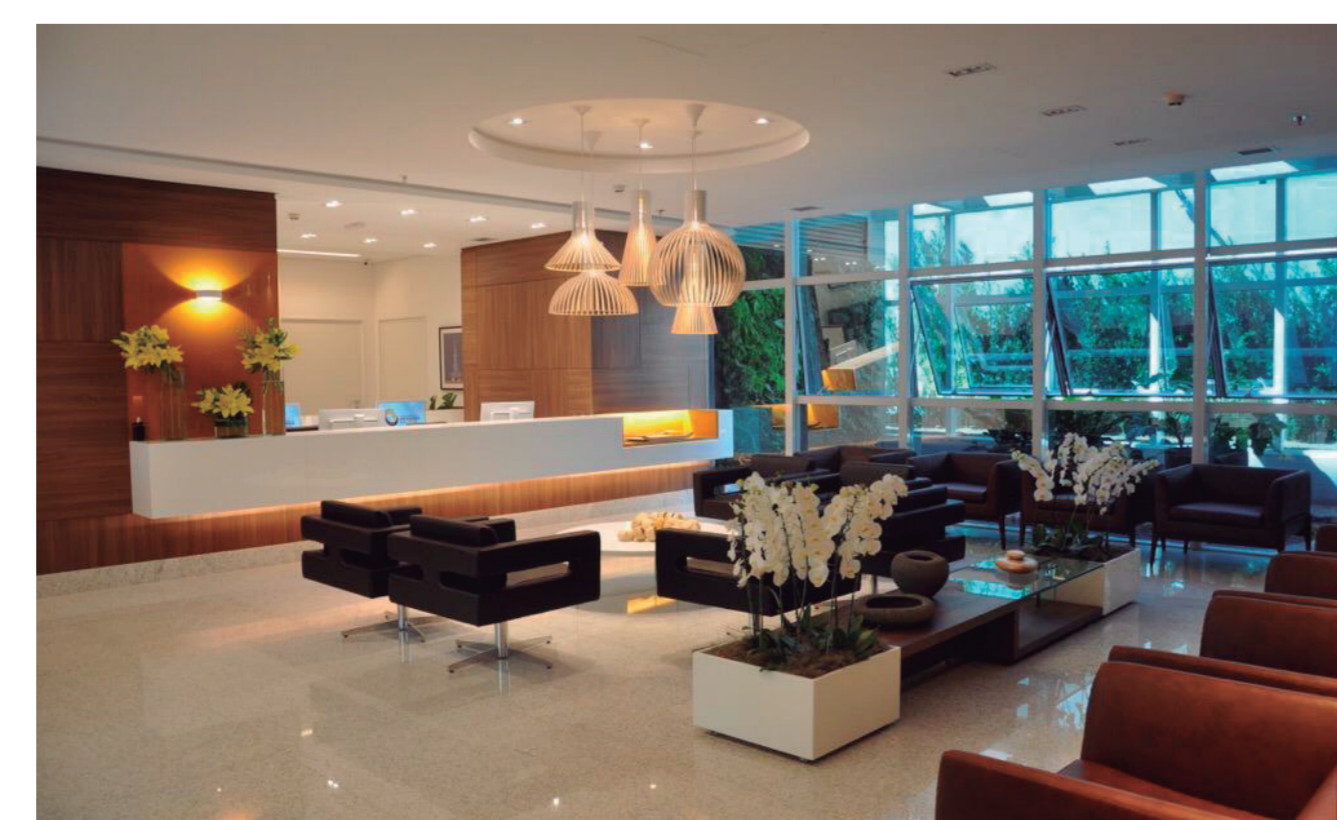
Life Expectancy

73.2 years

76.5 years

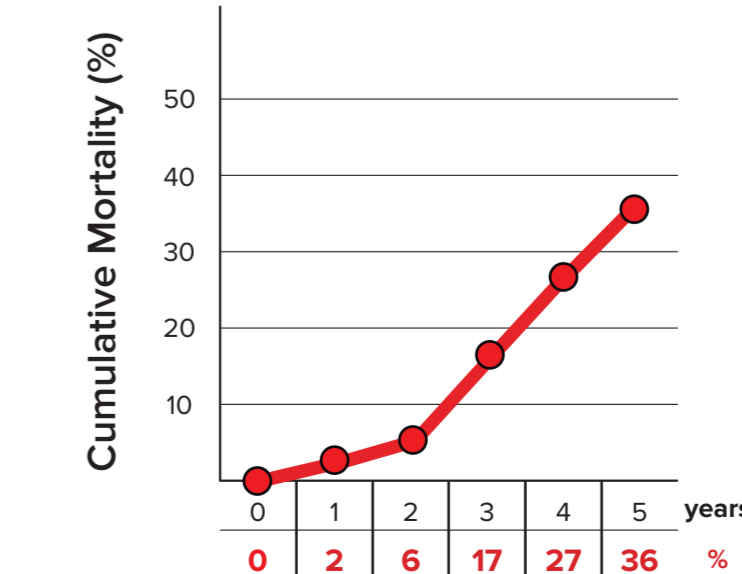
2009

2019



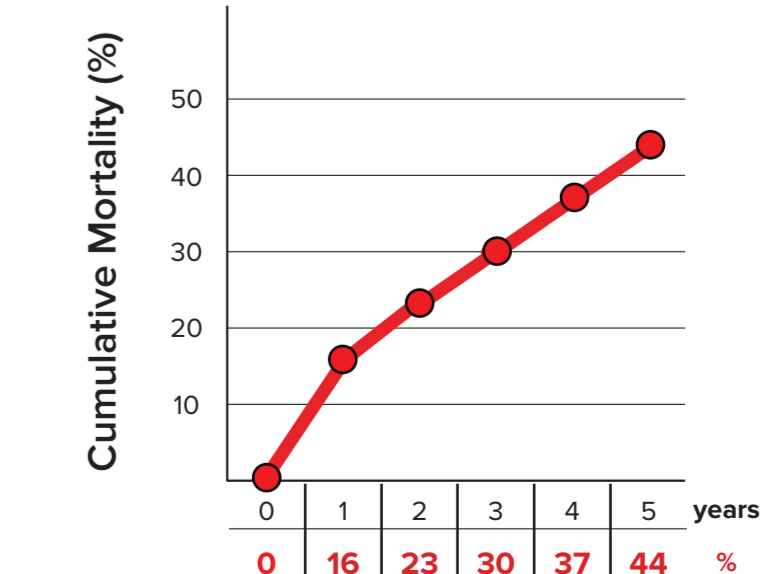
CBN&D Dialysis Patients

Mortality Curve



Brazil Dialysis Population

Mortality Curve



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