

Future Approaches to Replacement of Kidney Function

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One hundred years ago, kidney transplantation was seen as an exciting possibility. Fifty years ago the replacement of kidney function by transplantation and by dialysis was achieved. Although now in common practice, these technologies are far from optimal and cannot be applied to all who need them. Moreover, the need for kidney replacement may soon increase dramatically as new molecular techniques allow the early diagnosis of cancer and debilitating diseases. How might future efforts be directed toward this goal? The technologies presently envisioned as potential approaches to kidney replacement include improvement of devices, application of stem cells, organogenesis, and xenotransplantation. Each technology has advantages and each poses severe hurdles. In the end, a merging of technologies may allow the customizing of therapeutics and provide the best solutions to the replacement of kidney function.