



PUBLIC DIALYSIS TRANSPORT USING DIGITAL MEDIA

FINAL REPORT

DECEMBER 2017

Mary R. Lind
Rhonda L. Hensley

NORTH CAROLINA A&T STATE UNIVERSITY

US DEPARTMENT OF TRANSPORTATION GRANT 69A3551747125



DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated under the sponsorship of the Department of Transportation, University Transportation Centers Program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Public Dialysis Transport Efficiency Using Digital Media.		5. Report Date December 2017	
		6. Source Organization Code Budget \$69,065	
7. Author(s) Lind, Mary R.; Hensley, Rhonda L.		8. Source Organization Report No. CATM-2017-R1.NCAT	
9. Performing Organization Name and Address Center for Advanced Transportation Mobility Transportation Institute 1601 E. Market Street Greensboro, NC 27411		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. 69A3551747125	
12. Sponsoring Agency Name and Address University Transportation Centers Program (RDT-30) Office of the Secretary of Transportation-Research U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590-0001		13. Type of Report and Period Covered Final Report: January 2017 – December 2017	
		14. Sponsoring Agency Code USDOT/OST-R/CATM	
15. Supplementary Notes:			
16. Abstract The provision of para-transit services for patients needing dialysis is vital to patient maintenance. The availability of para-transit services varies in North Carolina counties depending on federal, state and local funding. Because these resources are limited, it is important to use available technologies to maximize resource usage. A survey was developed and administered to para-transit county administrators. Results of the preliminary data analysis showed that the use of technologies increased as the number of available dialysis centers increased. Counties also invested in more technologies as their feelings about funding adequacy for investments in general and from federal sources increased. Finally, those counties that felt they would be able to keep up with demand for dialysis services in the future tended to invest in more technologies.			
17. Key Words TRB key words		18. Distribution Statement Unrestricted; Document is available to the public through the National Technical Information Service; Springfield, VT.	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages #38	22. Price ...

TABLE OF CONTENTS

TABLE OF CONTENTS.....	iv
EXECUTIVE SUMMARY	1
BACKGROUND	2
DESCRIPTION OF PROBLEM.....	4
APPROACH AND METHODOLOGY	6
Data Analysis	7
FINDINGS; CONCLUSIONS; RECOMMENDATIONS	9
Differences Due to Location	9
Use of Technologies	10
Keeping Up with Growing Demand.....	11
Customer Satisfaction.....	11
Forecasting for the Future	12
DISCUSSION.....	12
REFERENCES	15
APPENDIX A - DIALYSIS CLINICS IN NORTH CAROLINA.....	18
APPENDIX B - SQUARE MILES PER DIALYSIS UNIT AND POVERTY LEVELS	34
APPENDIX C - PUBLICATIONS, PRESENTATIONS, POSTERS RESULTING FROM THIS PROJECT	38

EXECUTIVE SUMMARY

Patients with kidney disease face many difficulties in getting to and from life-saving dialysis treatments. Typical patients require multi-hour dialysis three times per week. Federal law mandates that these patients are covered under Medicare even if they are under 65 years of age. Medicare, however, does not provide needed transportation to the treatments. Even if they have transportation, many of the patients are too weak to drive after treatment or may find it difficult to find family members to take time to transport them to the treatments.

Para-transit services are offered to provide needed transport to life-saving dialysis centers. Governmental para-transit services are available in some but not all North Carolina's 100 counties. North Carolina is a state where the counties with the most resources are in the central, Piedmont area of the state. The Appalachian area and the Eastern part of the state are largely agricultural areas with lower tax bases and larger counties in terms of square feet. The poverty in these areas does not allow for much funding from county government sources, and a larger proportion of residents have limited means of transport. Limited funding is available through the Elderly/ Disabled Transportation Assistance Program and Medicare. Consequently, public transit managers need inexpensive yet effective means of scheduling transportation for these patients where dialysis is a life or death matter. Medical transportation needs in rural areas of North Carolina has been a focus of the NCA&T Transportation Institute for over 40 years (Saltzman, 1976; Sulek & Lind, 2000; Sulek & Lind 2005). Advances in digital communication media present opportunities to improve the efficiency of delivering these transit services. Findings regarding technologies used to assist with the scheduling are discussed in this paper. Results of discussions with North Carolina para-transit directors and dialysis clinics on how to provide such technologies to insure the patient is ready when the paratransit vehicle arrives will be presented.



BACKGROUND

Dialysis transit needs arose with the availability of the artificial kidney machine to cleanse the blood of patients with failing kidneys. Dr. Willem Kolff invented dialysis machines during World War II (Eggers, 2000). They became available on a larger scale with the invention of the shunt by Dr. Belding Scribner (Eggers, 2000). The lifesaving devices became part of the fabric of health care starting in the 70's. The passage of the Social Security Amendments of 1972 (P.L. 92-603); in which Section 299I enabled patients needing dialysis to receive treatment that would be covered by Medicare even if under the age of 65 (Swarminathan et al., 2012). There are about 300,000 people in the United States receiving dialysis treatment for end stage renal disease - ESRD (Kidney Disease Statistics for the United States, 2016).

For-profit dialysis chains dominate the market providing most of the dialysis centers in the country (Johnson, 2014). Results of this study show that this is also true in North Carolina (Appendix A). Also, Wake Forest Hospitals (Bowman Grey) operates some centers, and while a few dialysis centers are owned by individual doctors. Medicare payments and the efficiency of the for-profit chains have resulted in the dominance of the for-profits in providing dialysis centers even in remote, rural counties in North Carolina. Dialysis annual costs are around \$20 billion, and the number of patients rises from 6 to 7 percent annually with one-third of the patients in a minority category. Medicare pays about \$60,000 per year per Medicare patient (Swaminathan, Mor, Mehrotra, and Trivedi, 2012). Figure 1 shows the square miles per dialysis units in each county of North Carolina. Those that are darker blue are counties in which there is a greater distance to travel to the dialysis units.

DESCRIPTION OF PROBLEM

Not all dialysis patients need assistance in traveling to and from dialysis clinics; however, as the patient's health deteriorates it becomes more difficult for family members to meet patient needs after hours of dialysis treatment the patient is very tired. The paratransit vehicles used for patient transport in the counties include hydraulic lift devices to help with patients who may be in wheelchairs or otherwise immobile.

The provision of these transit services for dialysis patients to dialysis centers presents an agency problem (Eisenhardt, 1989) where the local counties provide the paratransit using non-emergency paratransit vehicles from funding sources that include federal, state, and local resources. Thus, the county paratransit operator is the agent that provides the principal, the dialysis center, with the work of transporting dialysis patients to their centers under conditions of incomplete and asymmetric information. In agency theory (Figure 2) the work carried out in this arrangement is the transport of needy patients from their homes to the dialysis centers and then back to their homes. Thus, the work of transport has been delegated from the dialysis clinics to the paratransit authorities in each county.

The goals of the principal and the agent may not be in alignment. The agent (paratransit) collects riders in need of paratransit services for doctor appointments, dialysis appointments, and other transit needs. Scheduling these pickups with a limited number of vehicles in counties creates scheduling and routing problems for the paratransit agencies. Further, the principal in this study has a set schedule where patients come to the dialysis clinic in three to four hour windows on a Monday, Wednesday, Friday or a Tuesday, Thursday, Saturday schedule. Asymmetric information for scheduling often exists between the dialysis centers (principal) in a county, the para-transit authority (agent), and the patient's knowledge of his/her schedule. If a patient is not ready for a paratransit pickup or a paratransit vehicle misses or is late for a dialysis patient

pickup this can have a cascading effect on these inter-related actors from the para-transit schedule, to other patients, to the dialysis clinics, on to receiving reimbursement for this transport.

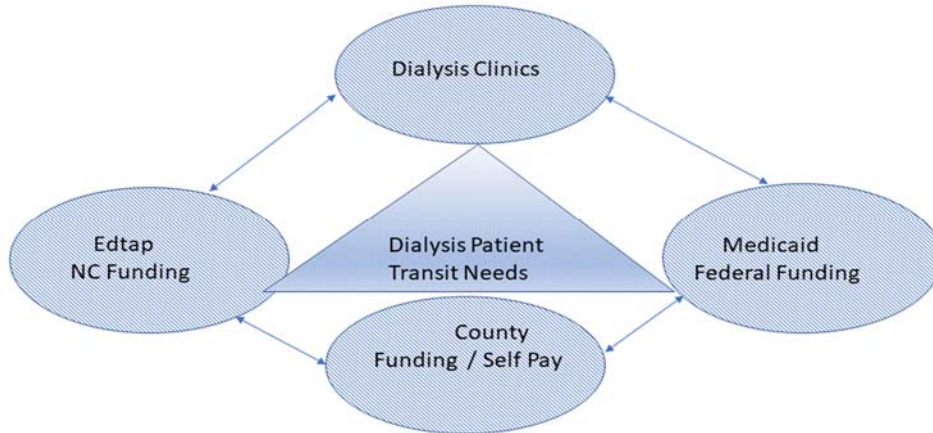


Figure 2: Agency Model

Most dialysis clinics (principals) have a social worker who works with the dialysis patients (agents) to obtain transportation. All patients who receive dialysis are deemed disabled, and qualify for Medicaid within the Medicare income guidelines, thus Medicaid will pay their travel costs within their guidelines. Other funding sources, if available, are used to supplement the cost of transportation to and from dialysis. Also, there is some federal funding from the Home and Community Block Grant federal program for those over the age of 60. There is a North Carolina program entitled the Elderly and Disabled Transportation Assistance Program (EDTAP) that provides transportation for those over the age of 60 and deemed disabled. There is a budget set for EDTAP based on the county population, and the funds are prone to be depleted before year end. Most dialysis patients are on a fixed income so that the part of the transportation cost the disabled patient pays often is more than he/she can afford. All these



sources and grants from the Federal Transportation Agency are used to buy the para-transit vehicles.

A coordination problem between these agencies (dialysis units, patients, and para-transit operators) exists. The principal (dialysis clinic) cannot verify that the agent (para-transit authority) has behaved appropriately due to asymmetric information sharing. Another issue is that of risk sharing that arises when the principal and agent have different attitudes towards risk. Dialysis clinics and patients know that the dialysis treatment is necessary for patient survival. The paratransit operators are aware of this risk yet they must transport many such patients under the scheduling and information difficulties noted above. The problem here is that the principal and the agent may prefer different actions because of these different risk preferences.

APPROACH AND METHODOLOGY

This study is part of a project for the Center for Advanced Transportation Mobility (CATM) located at North Carolina A&T State University. The study setting consists of all one hundred North Carolina counties where an attempt was made to contact those responsible for paratransit services in each county. The North Carolina Public Transit website was used to compile a list of preliminary contacts. County websites were checked to determine whether there was a para-transit contact. When a contact was unavailable, the county's public transit office or county administration was contacted by phone to identify the best contact.

A preliminary survey containing Likert scaled, short answer and open-ended questions was developed and pre-tested in two counties. Based on comments and suggestions, adjustments were made to the survey. County transportation agencies were then contacted and interviewed by phone to complete the survey. A total of 91 counties provided information for this study.



Data Analysis

Data were collected for 91 out of 100 counties. These counties were geographically dispersed throughout the state and populations were compared to those counties that participated in the study. As Table 1 shows, the non-responsive counties seemed to be in line with those counties that did participate. No factors were identified to indicate bias with regards to participation.

Table 1: Comparison of Respondents to Non-Respondents Based on Population

	Non-Respondents	Respondents
Average Population	111,824.09	96,584.53
Max	495,279.00	967,971.00
Min	13,487.00	4,141.00

In this preliminary data analysis, where the use of technologies in support of para-transit was a focus of the paper, an inter-item correlation analysis matrix was produced (see Table 2).

Table 2: Pearson Correlations¹

	technew	dialmeet	povlevel	CoPopn	Pat/Pop	q6	q7	q8	q9	q11	q12	q13	q14	q15
technew	1	-.152	.037	.099	-.031	.074	-.131	.337**	.218*	.357**	.511**	-.058	.299**	.217*
dialmeet		1	-.044	.169	.011	-.040	-.142	-.332**	-.109	-.422**	-.338**	-.290**	-.007	.138
povlevel			1	-.251*	.181	-.015	-.051	-.071	.089	-.069	.035	.078	-.030	.030
CoPopn				1	-.475**	.004	.068	.012	.031	-.034	.090	.033	.033	.109
Pat/Pop					1	-.064	-.118	.065	-.077	-.039	-.038	-.020	.022	.053
q6						1	.229*	.103	.141	.188	.344**	.036	.045	.013
q7							1	-.262*	.166	.036	.144	.068	-.046	-.032
q8								1	.413**	.317**	.370**	.114	.201	.185
q9									1	.223*	.363**	-.088	.080	.340**
q11										1	.398**	.139	.126	.162
q12											1	.085	.209*	.228*
q13												1	.038	.001
q14													1	.279**
q15														1

¹** . Correlation is significant at the 0.01 level (2-tailed); * . Correlation is significant at the 0.05 level (2-tailed).

Based on these inter-item correlations, the variable TechScore was created by combining the scores for questions 25 – 29 from the questionnaire (Table 3). These questions related to the use of technologies to control the transit provision and technologies related to the interface between the transit provider and the rider. The questions used a five-point Likert scale, and the questions were framed as “To what extent do you agree” where 1 = Strong Disagree to 5 = Strongly Agree).

Table 3: Technology Score Variable

	Patients use a Website to schedule trips (Q29)	Patients use the phone to schedule trips (Q28)	On-board cameras are used to monitor the vehicles (Q26)	GPS is used to locate vehicles (Q25)	Patients use a smartphone app to schedule trips (Q27)	TechScore
Mean	4.944	4.933	4.933	4.878	2.844	22.533
Minimum	1	3	3	1	1	11
Maximum	5	5	5	5	5	25
Variance	0.188	0.108	0.085	0.266	2.245	4.679
Std. Dev.	0.433	0.328	0.292	0.516	1.498	2.163
Count	90	90	90	90	90	90

FINDINGS; CONCLUSIONS; RECOMMENDATIONS

Differences Due to Location

Disparities between the lower income areas of the state and the higher income levels of the state were expected, and the data analysis supports it (see Appendix B). For instance, the poverty levels and county populations have a significant negative correlation ($p < 0.05$). This



finding suggests that the counties with larger populations have lower poverty levels (and vice versa). The state has a few larger population areas (for instance, the Raleigh, Durham, Chapel Hill metropolitan area) where more industries and jobs are located compared to lower populations in rural areas with little industry and few jobs. Another interesting finding was that county population has a negative correlation with the percentage of dialysis patients in the population suggesting that smaller counties have a larger proportion of dialysis patients.

Use of Technologies

The data also show some interesting findings related to the use of technologies and feelings about adequacy of funding for paratransit services (see Table 4). There is a significant positive correlation between the perception that overall funding is adequate and the adoption of technologies ($p < 0.001$).

Table 4: Correlations of Questions Related to Technology Score

Question	Correlation	Sign
On average, how many dialysis patients do you serve? (Q3)	0.018	ns
How many dialysis centers does your county have? (Q5)	.193	p<.10
To what extent is(are) funding adequate? 1 = Very inadequate to 5 = Very adequate		
Paratransit funding from state sources. (Q6)	.074	ns
Paratransit funding from county sources. (Q7)	-.131	ns
Paratransit funding from federal sources. (Q8)	.34	p<.001
Overall funding for paratransit services. (Q9)	0.218	p<.05
To what extent do you agree? 1 = Strongly Disagree to 5 = Strongly Agree.		
We feel that we will be able to keep up with demand for dialysis services. (Q11)	0.357	p<.001
We have adequate funding to invest in new transit technologies. (Q12)	0.511	p<.001
The number of dialysis centers will increase in the next 5 years. (Q15)	0.217	p<.05
#of Meetings with each dialysis center per year	-.152	ns
Patients need additional service for transport (Q14)	.299	p<.004
All of our buses are ADA compliant. (Q23)	-.028	ns



Keeping Up with Growing Demand

Finally, there is a positive correlation between feelings that the county will be able to keep up with demand for dialysis services and the technology score ($p < 0.001$). Those counties investing in technologies (and finding the funding for those investments) tend to be more positive about future funding and their ability to keep up with growing demand.

There is a positive correlation between state and county funding sources ($p < 0.30$) and a negative correlation between federal and county funding ($p < 0.013$). This finding suggests that in the minds of the transit directors, state and county funding are viewed in the same way. The negative correlation suggests that as their confidence in federal funding increases, their confidence in county funding decreases. This finding is also supported by the positive correlation between overall funding for paratransit services and funding from federal sources ($p < 0.001$).

Also examined were feelings about the ability to keep up with an increasing demand for dialysis transportation. First, there was a positive correlation between keeping up with increasing demand and feelings about the adequacy of federal funding ($p < 0.002$). This finding suggests that as confidence in the transit company's ability to keep up increases so too does the confidence placed in the availability of getting federal funding.

Customer Satisfaction

The negative correlation between dialmeet (the number of times the paratransit operator calls the dialysis clinic during the year) with Q13 (patients are satisfied with paratransit services offered) indicates that where there is higher satisfaction on paratransit services, then fewer phone calls are needed. This relationship implies that when the paratransit is running smoothly less communication with the dialysis centers are needed. More calls indicate troubleshooting to handle scheduling and to reduce the missed appointments. There is a positive relationship



between what transit directors see as patient needs for additional service for dialysis support and their feelings about the adequacy of funding for new technologies.

Forecasting for the Future

Transit directors who see the need for an increasing number of dialysis centers in the next five years tend to invest in more technologies. The relationship between dialysis centers and investment in technologies also goes hand in hand with the view that as growth increases adequate funding will be available to invest in new paratransit technologies. Finally, there is a positive correlation between expected growth in dialysis centers and the need for additional service for dialysis support.

DISCUSSION

This preliminary data analysis from an ongoing project provides an interesting look at the current state of paratransit services for dialysis treatment in North Carolina. Overall, it appears that counties with larger populations are more confident in their ability to keep up with growing demand for dialysis transport.

An application of agency theory suggests that one important component in improving transit service to dialysis patients is to use available technologies to connect the three constituencies affected by the need for transport (Figure 3). First, the transit agencies need to utilize their resources in a cost-efficient manner. Avoiding waste due to lack of contact with patients (who may have decided on another means of transportation, rescheduled their appointment or be unable to get ready in a timely fashion) is important. From the perspective of the dialysis centers, they would like to run their schedules in an efficient manner (schedule those patients who take longer or have more variability in time later in the day and make sure they are fully utilizing their facilities). From the patient's perspective, they would like to have transport

provided at times that do not keep them waiting for an appointment at the dialysis center or leave them at the dialysis center after treatment.

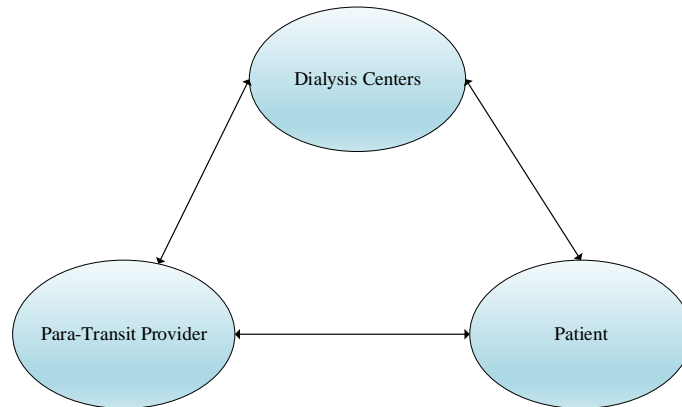


Figure 3: Facilitating Communication Efficiency

The patient needs are the center of this agency model with the patients needing to obtain their dialysis treatments on a set schedule at a set dialysis unit located as near as possible to where they live. Transportation to the dialysis centers can be done by the patient’s family or via paratransit. When paratransit services are used, the payment for these services is complicated and varies based on the finances of the county. A reliable payment partner is the United States Americans with Disability Act where the transit costs can be covered. In North Carolina, there are EDTAP funds for riders over the age of 65; however, the funds are often depleted before year end. Some counties use the United Way and other non-profits to raise funding for paratransit equipment and services. Also, riders are charged to make up the difference where there is not enough funding. These transit agencies, dialysis principals, and dialysis patients create communication and coordination issues across these entities due to communication and differing goals. Further complicating this is the fact that each of these is implemented in different counties where each county should establish its own processes of coordination. The county



interviews indicated a need for improved communication technologies but a recognition that the weakest link is the dialysis patient who may not even have a cell phone.

Future research is needed to identify low cost digital technologies that can reduce the lost communication in this agency model where dialysis clinics, patients, and paratransit systems must work closely together. Of interest is the identification of technology that will work in remote, rural areas of the state to serve as an extension of the paratransit system for the dialysis patients. A comparative prototype study of a system using traditional communication technologies to one that can be digitally based would help to identify the usability of such technology for the ADA patients who are in most cases not digitally savvy as most are part of the Baby Boomer age group.

Further research is needed on the unique demands of establishing a paratransit model across county governments in North Carolina that vary from urban to rural. Neither funding nor infrastructure permits a statewide solution for providing dialysis transport for needy patients to and from their homes to dialysis centers. This life-saving treatment must be received two times a week for three to four hours per session per patient. Funding for this transportation is a combination of federal, state, and some local United Way funding and as the agency model shows, this necessitates the need for close coordination to prevent information loss and asymmetry and to overcome conflicting goals to satisfy the transportation needs of the dialysis patients often living at the poverty level.

Investment in digital scheduling and notification systems for paratransit is limited at best. Needed are digital, wearable technologies for these patients to enable communication with the paratransit agencies. Patients need to know the time of their pickup, and they need to know if the paratransit vehicle is running late both for pickup from the home and pickup at the dialysis



center. Many of these patients are not technology savvy, and many may be elderly with limited vision. Needed are devices with a high degree of usability. Funding for these devices for the patients and in the paratransit operations is an issue as well. Dialysis clinics are a key part of this agency model. Currently, the dialysis clinics provide social workers to coordinate with the patients. These social workers could become for the patients the means of receiving training in using the devices. The social workers are strong advocates for their dialysis patients. Given the constraints of lack of funding and lack of user knowledge of handheld devices, presents an interesting but important problem. Resolution of this problem will cut costs from inefficient paratransit systems and help save lives. Further research will identify alternative solutions that may help in this paratransit context.

REFERENCES

- Eggers, P.W. (2000). Medicare's end stage renal disease program. *Health Care Financing Review*, 22(1), 55-60.
- Eisenhardt, M, K. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57).
- Johnson, S.R. (2014). Dialysis demand strong as kidney disease grows. *Modern Healthcare*, online at <http://www.modernhealthcare.com/article/20141011/NEWS/141019999>.
- Kidney Disease Statistics for the United States, NIDDK, available online at <https://www.niddk.nih.gov/health-information/health-statistics/kidney-disease>, December 6, 2016.
- Rettig, R.A. (1991). Origins of the Medicare kidney disease entitlement: The social security amendments of 1972. In K.E Hanna (Eds.), *Biomedical Politics* (pp. 176-214) Washington, D.C.: National Academy Press. <https://www.nap.edu/read/1793/chapter/6#177>.
- Rubenstein, C. (2004). Dialysis, where Medicaid steps in. Jan. 24th. <http://www.nytimes.com/2004/01/25/nyregion/dialysis-where-medicaid-steps-in.html>.
- Sulek, J. and Lind, M. A (2000) Systems Model for Evaluating Transit Performance, *Journal of Public Transportation*, 3(1), 29-47.



Sulek, J. and Lind, M. (2005) Fail-Safe Methods for Paratransit Safety, *Journal of Public Transportation*, 8(4), 65-85.

Saltzman, A. (1976). Role of paratransit in rural transportation. Paratransit. National Research Council, Transportation Research Board. Proceedings of a Conference Sponsored by the Urban Mass Transportation Administration held November 9-12 Washington, DC, 137-142.
<http://onlinepubs.trb.org/Onlinepubs/sr/sr164/164-015.pdf>

Swaminathan, S., Mor, V., Mehrotra, R., Trivedi, A. (2012). Medicare's payment strategy for end-stage renal disease now embraces bundled payment and pay-for-performance to cut costs. *Health Affairs*, 31(9), 2051-2058.



APPENDIX A - DIALYSIS CLINICS IN NORTH CAROLINA

Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
BURLINGTON REGIONAL DIALYSIS BMA OF BURLINGTON INC	BURLINGTON	NC	27215	ALAMANCE	(336) 570-3494	DAVITA FRESENIUS MEDICAL CARE	Profit	26
NORTH BURLINGTON DIALYSIS ALAMANCE COUNTY	BURLINGTON	NC	27217	ALAMANCE	(336) 227-3450	DAVITA	Profit	13
DIALYSIS CAROLINA DIALYSIS OF MEBANE	GRAHAM	NC	27253	ALAMANCE	(336) 570-1263	DAVITA FRESENIUS MEDICAL CARE	Profit	10
FRESENIUS MEDICAL CARE OF ALEXANDER COUNTY	MEBANE	NC	27302	ALAMANCE	(919) 563-2924	FRESENIUS MEDICAL CARE	Profit	20
FRESENIUS MEDICAL CARE OF ANSON COUNTY	TAYLORSVILLE	NC	28681	ALEXANDER	(828) 632-3547	FRESENIUS MEDICAL CARE	Profit	10
DIALYSIS CARE OF ANSON COUNTY	WADESBORO	NC	28170	ANSON	(704) 695-1460	FRESENIUS MEDICAL CARE	Profit	16
BMA OF PAMLICO	WADESBORO	NC	28170	ANSON	(704) 694-5545	DAVITA FRESENIUS MEDICAL CARE	Profit	15
BMA OF WINDSOR INC BIO-MEDICAL APPLICATIONS OF NORTH CAROLINA SOUTHEASTERN DIALYSIS	WASHINGTON	NC	27889	BEAUFORT	(252) 975-5950	FRESENIUS MEDICAL CARE	Profit	25
ELIZABETHTOWN	WINDSOR	NC	27983	BERTIE	(252) 794-5041	FRESENIUS MEDICAL CARE	Profit	20
ELIZABETHTOWN	ELIZABETHTOWN	NC	28337	BLADEN	(910) 879-0046	FRESENIUS MEDICAL CARE	Profit	0
	ELIZABETHTOWN	NC	28337	BLADEN	(910) 862-7022	DAVITA	Profit	26



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
TOTAL RENAL CARE OF NORTH CAROLINA, LLC SOUTHEASTERN	LELAND	NC	28451	BRUNSWICK	(910) 371-0391	DAVITA	Profit	10
DIALYSIS SHALLOTTE SOUTHPORT DIALYSIS CENTER	SHALLOTTE	NC	28470	BRUNSWICK	(910) 754-5563	DAVITA	Profit	18
FMC BRUNSWICK COUNTY	SOUTHPORT	NC	28461	BRUNSWICK	(910) 454-0272	DAVITA	Profit	13
ASHEVILLE KIDNEY CENTER INC	SUPPLY	NC	28462	BRUNSWICK	(910) 754-3280	FRESENIUS MEDICAL CARE	Profit	10
TOTAL RENAL CARE OF NORTH CAROLINA, LLC WEAVERVILLE DIALYSIS BMA OF BURKE COUNTY INC	ASHEVILLE	NC	28805	BUNCOMBE	(828) 251-1224	DAVITA	Profit	52
HARRISBURG DIALYSIS CENTER	ASHEVILLE	NC	28801	BUNCOMBE	(828) 255-2839	DAVITA	Profit	10
COPPERFIELD DIALYSIS	WEAVERVILLE	NC	28787	BUNCOMBE	(828) 658-1143	DAVITA	Profit	20
BMA OF LENOIR INC	MORGANTON	NC	28655	BURKE	(828) 439-8489	FRESENIUS MEDICAL CARE	Profit	33
BMA OF CRYSTAL COAST INC	CONCORD	NC	28027	CABARRUS	(704) 792-1144	DAVITA	Profit	19
BIO-MEDICAL APPLICATIONS OF NORTH CAROLINA, INC.	CONCORD	NC	28025	CABARRUS	(704) 795-7552	DAVITA	Profit	27
FRESENIUS MEDICAL CARE CASWELL	LENOIR	NC	28645	CALDWELL	(828) 754-5322	FRESENIUS MEDICAL CARE	Profit	34
FRESENIUS MEDICAL SERVICES OF CATAWBA VALLEY	MOREHEAD CITY	NC	28557	CARTERET	(252) 808-0444	FRESENIUS MEDICAL CARE	Profit	16
	SWANSBORO	NC	28584	CARTERET	(252) 393-2039	FRESENIUS MEDICAL CARE	Profit	10
	YANCEYVILLE	NC	27379	CASWELL	(336) 694-1084	FRESENIUS MEDICAL CARE	Profit	10
	CONOVER	NC	28613	CATAWBA	(828) 464-3830	FRESENIUS MEDICAL CARE	Profit	25



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
BIO-MEDICAL APPLICATIONS OF NORTH CAROLINA, INC.	HICKORY	NC	28602	CATAWBA	(828) 304-0018	FRESENIUS MEDICAL CARE	Profit	5
FMC DIALYSIS SERVICES OF HICKORY	HICKORY	NC	28602	CATAWBA	(828) 324-9580	FRESENIUS MEDICAL CARE	Profit	35
CAROLINA DIALYSIS PITTSBORO	PITTSBORO	NC	27312	CHATHAM	(919) 545-0019	FRESENIUS MEDICAL CARE	Non-Profit	10
CAROLINA DIALYSIS SILER CITY	SILER CITY	NC	27344	CHATHAM	(919) 663-1054	FRESENIUS MEDICAL CARE	Non-Profit	22
SMOKEY MOUNTAIN DIALYSIS DENOVO FACILITY	MURPHY	NC	28906	CHEROKEE	(828) 835-4910	DAVITA	Profit	10
EDENTON DIALYSIS DIALYSIS CLINIC INC	EDENTON	NC	27932	CHOWAN	(252) 482-0763	DAVITA	Profit	17
KINGS MOUNTAIN	KINGS MOUNTAIN	NC	28086	CLEVELAND	(704) 739-9342	DIALYSIS CLINIC, INC.	Non-Profit	15
DCI SHELBY INC	SHELBY	NC	28150	CLEVELAND	(704) 481-8405	DIALYSIS CLINIC, INC.	Non-Profit	33
DIALYSIS CLINIC, INC	SHELBY	NC	28150	CLEVELAND	(704) 434-2291	DIALYSIS CLINIC, INC.	Profit	15
DCI SOUTH SHELBY DAVITA DIALYSIS OF CHADBOURN	SHELBY	NC	28152	CLEVELAND	(704) 487-0399	DIALYSIS CLINIC, INC.	Non-Profit	10
SOUTHEASTERN DIALYSIS DAVITA WHITEVILLE	CHADBOURN	NC	28431	COLUMBUS	(910) 654-3190	DAVITA	Profit	17
FMC DIALYSIS OF CRAVEN COUNTY	WHITEVILLE	NC	28472	COLUMBUS	(910) 642-0233	DAVITA	Profit	26
NEW BERN DIALYSIS	NEW BERN	NC	28560	CRAVEN	(252) 633-3378	FRESENIUS MEDICAL CARE	Profit	28
	NEW BERN	NC	28560	CRAVEN	(252) 633-6303	FRESENIUS MEDICAL CARE	Profit	37



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
FMC DIALYSIS SERVICES SOUTH RAMSEY FAYETTEVILLE KIDNEY CENTER	FAYETTEVILLE	NC	28301	CUMBERLAND	(910) 221-4363	FRESENIUS MEDICAL CARE	Profit	51
FMC OF WEST FAYETTEVILLE	FAYETTEVILLE	NC	28304	CUMBERLAND	(910) 323-5288	FRESENIUS MEDICAL CARE	Profit	38
FMC DIALYSIS SERVICES NORTH RAMSEY	FAYETTEVILLE	NC	28304	CUMBERLAND	(910) 867-2602	FRESENIUS MEDICAL CARE	Profit	37
DARE COUNTY DIALYSIS LEXINGTON DIALYSIS CENTER OF WAKE FOREST UNIVERSITY THOMASVILLE DIALYSIS CENTER OF WAKE FOREST UNIVERSITY DAVIE KIDNEY CENTER	MANTEO	NC	27954	DARE	(252) 475-3530	FRESENIUS MEDICAL CARE	Profit	40
OF WAKE FOREST UNIVERSITY SOUTHEASTERN DIALYSIS KENANSVILLE	LEXINGTON	NC	27292	DAVIDSON	(336) 248-6808	WAKE FOREST UNIVERSITY	Non-Profit	9
WALLACE DIALYSIS RAI CARE CENTERS WARSAW	THOMASVILLE	NC	27360	DAVIDSON	(336) 472-4500	INDEPENDENT	Non-Profit	24
TOTAL RENAL CARE, INC. FREEDOM LAKE DIALYSIS CENTER	MOCKSVILLE	NC	27028	DAVIE	(336) 753-1210	INDEPENDENT	Non-Profit	13
	KENANSVILLE	NC	28349	DUPLIN	(910) 296-0748	DAVITA	Profit	14
	WALLACE	NC	28466	DUPLIN	(910) 285-6424	DAVITA	Non-Profit	15
	WARSAW	NC	28398	DUPLIN	(910) 293-9984	FRESENIUS MEDICAL CARE	Profit	16
	DURHAM	NC	27703	DURHAM	(919) 206-4606	TOTAL RENAL CARE, INC.	Profit	10
	DURHAM	NC	27704	DURHAM	(919) 471-1718	FRESENIUS MEDICAL CARE	Profit	22



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
DURHAM WEST DIALYSIS	DURHAM	NC	27705	DURHAM	(919) 384-0712	DAVITA	Profit	30
FMS SOUTH DURHAM DIALYSIS CENTER	DURHAM	NC	27713	DURHAM	(919) 544-3451	FRESENIUS MEDICAL CARE	Profit	18
DURHAM DIALYSIS WEST PETTIGREW DIALYSIS CENTER	DURHAM	NC	27701	DURHAM	(919) 680-0002	DAVITA	Profit	25
DURHAM DIALYSIS CENTER	DURHAM	NC	27705	DURHAM	(919) 286-4777	FRESENIUS MEDICAL CARE	Profit	24
SOUTHPOINT DIALYSIS CENTER	DURHAM	NC	27713	DURHAM	(919) 544-5536	DAVITA	Profit	12
DUKE UNIVERSITY MEDICAL CENTER DIALYSIS UNIT	DURHAM	NC	27705	DURHAM	(919) 684-3012	INDEPENDENT FRESENIUS	Non-Profit	16
FMC DIALYSIS SERVICES OF BRIGGS AVENUE	DURHAM	NC	27703	DURHAM	(919) 598-9992	MEDICAL CARE	Profit	29
BMA OF EAST ROCKY MOUNT DIALYSIS CARE OF	ROCKY MOUNT	NC	27801	EDGEcombe	(252) 442-6311	FRESENIUS MEDICAL CARE	Profit	30
EDGEcombe COUNTY PIEDMONT DIALYSIS CENTER OF WAKE	TARBORO	NC	27886	EDGEcombe	(252) 641-9004	DAVITA	Profit	35
FOREST UNIVERSITY MILLER STREET DIALYSIS CENTER OF	WINSTON SALEM	NC	27101	FORSYTH	(336) 721-1360	WAKE FOREST UNIVERSITY	Non-Profit	58
WAKE FOREST UNIVERSITY WFU BAPTIST MEDICAL CENTER DIALYSIS UNIT	WINSTON SALEM	NC	27103	FORSYTH	(336) 724-0468	WAKE FOREST UNIVERSITY	Non-Profit	36
SALEM KIDNEY CENTER OF WAKE FOREST UNIVERSITY	WINSTON SALEM	NC	27157	FORSYTH	(336) 716-3170	WAKE FOREST UNIVERSITY	Non-Profit	4
UNIVERSITY	WINSTON SALEM	NC	27101	FORSYTH	(336) 761-8808	WAKE FOREST UNIVERSITY	Non-Profit	39



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
NORTHSIDE DIALYSIS CENTER OF WAKE FOREST UNIVERISITY	WINSTON SALEM	NC	27105	FORSYTH	(336) 744-0577	WAKE FOREST UNIVERSITY	Non-Profit	45
DIALYSIS CARE OF FRANKLIN COUNTY INC	LOUISBURG	NC	27549	FRANKLIN	(919) 496-0300	DAVITA	Profit	27
BIO-MEDICAL APPLICATIONS OF NORTH CAROLINA, INC.	LOUISBURG	NC	27549	FRANKLIN	(919) 497-0180	FRESENIUS MEDICAL CARE	Profit	4
FRESENIUS MEDICAL CARE FRANKLIN COUNTY HOME DIALYSIS	YOUNGSVILLE	NC	27596	FRANKLIN	(919) 554-8534	FRESENIUS MEDICAL CARE	Profit	3
BELMONT DIALYSIS CENTER	BELMONT	NC	28012	GASTON	(704) 827-2931	FRESENIUS MEDICAL CARE	Profit	18
FRESENIUS MEDICAL CARE GASTONIA	GASTONIA	NC	28054	GASTON	(704) 864-8863	FRESENIUS MEDICAL CARE	Profit	39
BMA SOUTH GASTON DIALYSIS	GASTONIA KINGS	NC	28052	GASTON	(704) 867-3417	FRESENIUS MEDICAL CARE	Profit	26
BMA KINGS MOUNTAIN FMS DIALYSIS SERVICES	MOUNTAIN	NC	28086	GASTON	(704) 730-1270	FRESENIUS MEDICAL CARE	Profit	16
OF OXFORD	OXFORD	NC	27565	GRANVILLE	(919) 693-7507	FRESENIUS MEDICAL CARE	Profit	23
FMC DIALYSIS SERVICES NEUSE RIVER	OXFORD	NC	27565	GRANVILLE	(919) 603-1800	FRESENIUS MEDICAL CARE	Profit	22
GREENE COUNTY DIALYSIS CENTER	SNOW HILL	NC	28580	GREENE	(252) 747-9987	DAVITA	Profit	21
BMA NORTHWEST GREENSBORO KIDNEY CENTER	GREENSBORO	NC	27410	GUILFORD	(336) 664-6869	FRESENIUS MEDICAL CARE	Profit	33



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
FMC OF EAST GREENSBORO GREENSBORO KIDNEY CENTER	GREENSBORO	NC	27405	GUILFORD	(336) 358-1233	FRESENIUS MEDICAL CARE	Profit	39
BMA OF SOUTH GREENSBORO INC	GREENSBORO	NC	27405	GUILFORD	(336) 375-1400	FRESENIUS MEDICAL CARE	Profit	56
HIGH POINT KIDNEY CENTER OF WAKE FOREST UNIVERSITY	GREENSBORO	NC	27406	GUILFORD	(336) 271-8178	FRESENIUS MEDICAL CARE	Profit	59
TRIAD DIALYSIS CENTER BMA OF SOUTHWEST GREENSBORO	HIGH POINT	NC	27262	GUILFORD	(336) 889-9200	WAKE FOREST UNIVERSITY	Non-Profit	42
BMA OF ROANOKE RAPIDS INC	HIGH POINT	NC	27265	GUILFORD	(336) 454-0076	WAKE FOREST UNIVERSITY	Non-Profit	27
HALIFAX COUNTY DIALYSIS CENTER	JAMESTOWN	NC	27282	GUILFORD	(336) 854-7807	FRESENIUS MEDICAL CARE	Profit	33
BIO-MEDICAL APPLICATIONS OF NORTH CAROLINA, INC.	ROANOKE RAPIDS	NC	27870	HALIFAX	(252) 535-1000	FRESENIUS MEDICAL CARE	Profit	36
BIO-MEDICAL APPLICATIONS OF NORTH CAROLINA, INC. DUNN KIDNEY CENTER INC	SCOTLAND NECK	NC	27874	HALIFAX	(252) 826-5722	FRESENIUS MEDICAL CARE	Profit	19
FRESENIUS MEDICAL CARE OF LILLINGTON	ANGIER	NC	27501	HARNETT	(919) 639-3064	FRESENIUS MEDICAL CARE	Profit	10
DAVITA WAYNESVILLE DIALYSIS CENTER	CAMERON	NC	28326	HARNETT	(919) 499-1483	FRESENIUS MEDICAL CARE	Profit	11
	DUNN	NC	28334	HARNETT	(910) 892-7811	FRESENIUS MEDICAL CARE	Profit	35
	LILLINGTON	NC	27546	HARNETT	(910) 814-1800	FRESENIUS MEDICAL CARE	Profit	17
	CLYDE	NC	28721	HAYWOOD	(828) 627-2907	DAVITA	Profit	18



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
HENDERSONVILLE DIALYSIS CENTER	HENDERSONVILLE	NC	28792	HENDERSON	(828) 697-1602	DAVITA	Profit	24
AHOSKIE DIALYSIS CARE OF HOKE COUNTY INC	AHOSKIE	NC	27910	HERTFORD	(252) 332-3896	DAVITA	Profit	26
LAKE NORMAN DIALYSIS CENTER OF WAKE FOREST UNIVERSITY	RAEFORD	NC	28376	HOKE	(910) 875-6561	DAVITA	Profit	29
INDEPENDENT NEPHROLOGY SERVICES IREDELL COUNTY	MOORESVILLE	NC	28117	IREDELL	(704) 799-1860	WAKE FOREST UNIVERSITY	Non-Profit	27
WEST IREDELL DIALYSIS CENTER	MOORESVILLE	NC	28117	IREDELL	(704) 663-3534	FRESENIUS MEDICAL CARE	Profit	3
STATESVILLE DIALYSIS CENTER OF WAKE FOREST UNIVERSITY	STATESVILLE	NC	28625	IREDELL	(704) 881-0336	WAKE FOREST UNIVERSITY	Non-Profit	20
INS STATESVILLE SYLVA DIALYSIS CENTER	STATESVILLE	NC	28625	IREDELL	(704) 872-0148	WAKE FOREST UNIVERSITY	Non-Profit	27
FRESENIUS MEDICAL CARE STALLINGS STATION	STATESVILLE	NC	28625	IREDELL	(704) 878-6590	FRESENIUS MEDICAL CARE	Profit	6
FMC FOUR OAKS JOHNSTON DIALYSIS CENTER INC	SYLVA	NC	28779	JACKSON	(828) 586-3340	DAVITA	Profit	16
FMC DIALYSIS SERVICES OF JONES COUNTY	CLAYTON	NC	27520	JOHNSTON	(919) 550-7456	FRESENIUS MEDICAL CARE	Profit	24
	FOUR OAKS	NC	27524	JOHNSTON	(919) 963-2211	FRESENIUS MEDICAL CARE	Profit	19
	SMITHFIELD	NC	27577	JOHNSTON	(919) 934-9188	FRESENIUS MEDICAL CARE	Profit	25
	TRENTON	NC	28585	JONES	(252) 448-4575	FRESENIUS MEDICAL CARE	Profit	10



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
CAROLINA DIALYSIS, LLC	SANFORD	NC	27332	LEE	(919) 775-3725	FRESENIUS MEDICAL CARE	Profit	13
CAROLINA DIALYSIS SANFORD FMC OF KINSTON DIALYSIS UNIT	SANFORD	NC	27330	LEE	(919) 718-0680	FRESENIUS MEDICAL CARE	Profit	33
FMC VERNON DIALYSIS UNIT	KINSTON	NC	28504	LENOIR	(252) 522-5725	FRESENIUS MEDICAL CARE	Profit	39
FMC LINCOLNTON DIALYSIS	KINSTON	NC	28504	LENOIR	(252) 522-1000	FRESENIUS MEDICAL CARE	Profit	24
TOTAL RENAL CARE OF NORTH CAROLINA LLC	LINCOLNTON	NC	28092	LINCOLN	(704) 736-9300	FRESENIUS MEDICAL CARE	Profit	28
DIALYSIS CARE OF MARTIN COUNTY INC	FRANKLIN	NC	28734	MACON	(828) 369-1957	DAVITA	Profit	9
MCDOWELL COUNTY DIALYSIS	WILLIAMSTON	NC	27892	MARTIN	(252) 792-2386	DAVITA	Non-Profit	25
CHARLOTTE DIALYSIS METROLINA KIDNEY CENTER WEST	MARION	NC	28752	MCDOWELL	(828) 659-9790	DAVITA	Profit	13
CHARLOTTE FRESENIUS MEDICAL CARE CHARLOTTE	CHARLOTTE	NC	28208	MECKLENBURG	(704) 333-5535	DAVITA	Profit	32
NORTH CHARLOTTE DVA HEALTHCARE RENAL CARE, INC.	CHARLOTTE	NC	28208	MECKLENBURG	(704) 393-5509	FRESENIUS MEDICAL CARE	Profit	29
FMC OF NORTH CHARLOTTE INDEPENDENT NEPHROLOGY SERVICES	CHARLOTTE	NC	28204	MECKLENBURG	(704) 348-2950	FRESENIUS MEDICAL CARE	Profit	43
CHARLOTTE	CHARLOTTE	NC	28269	MECKLENBURG	(704) 599-1355	DAVITA	Profit	41
CHARLOTTE	CHARLOTTE	NC	28227	MECKLENBURG	(704) 573-2549	DAVITA	Profit	12
CHARLOTTE	CHARLOTTE	NC	28213	MECKLENBURG	(704) 596-0680	FRESENIUS MEDICAL CARE	Profit	28
CHARLOTTE	CHARLOTTE	NC	28262	MECKLENBURG	(704) 717-2825	FRESENIUS MEDICAL CARE	Profit	10



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
CAROLINAS MEDICAL CENTER DIALYSIS UNIT	CHARLOTTE	NC	28232	MECKLENBURG	(704) 381-7175	INDEPENDENT FRESENIUS	Non-Profit	9
BMA NATIONS FORD PRESBYTERIAN HOSPITAL	CHARLOTTE	NC	28273	MECKLENBURG	(704) 552-9102	MEDICAL CARE	Profit	28
BMA OF BEATTIES FORD INC	CHARLOTTE	NC	28204	MECKLENBURG	(704) 384-4034	INDEPENDENT FRESENIUS	Non-Profit	2
DSI CHARLOTTE LATROBE DIALYSIS	CHARLOTTE	NC	28216	MECKLENBURG	(704) 394-7335	MEDICAL CARE DIVERSIFIED SPECIALTY INSTITUTES (DSI) FRESENIUS	Profit	32
BMA EAST CHARLOTTE CHARLOTTE EAST DIALYSIS	CHARLOTTE	NC	28211	MECKLENBURG	(704) 366-5299	INSTITUTES (DSI) FRESENIUS	Profit	24
FRESENIUS MEDICAL CARE SOUTHWEST CHARLOTTE	CHARLOTTE	NC	28205	MECKLENBURG	(704) 334-2226	MEDICAL CARE	Profit	25
DSI GLENWATER DIALYSIS SOUTH CHARLOTTE	CHARLOTTE	NC	28212	MECKLENBURG	(704) 535-3962	DAVITA	Profit	26
HUNTERSVILLE DIALYSIS	CHARLOTTE	NC	28275	MECKLENBURG	(704) 504-2667	FRESENIUS MEDICAL CARE DIVERSIFIED SPECIALTY INSTITUTES (DSI)	Profit	10
INDEPENDENT NEPHROLOGY SERVICES HUNTERSVILLE	CHARLOTTE	NC	28226	MECKLENBURG	(704) 503-6900	DAVITA	Profit	42
FRESENIUS MEDICAL CARE MATTHEWS	HUNTERSVILLE	NC	28078	MECKLENBURG	(704) 912-3890	DAVITA	Profit	10
	HUNTERSVILLE	NC	28078	MECKLENBURG	(704) 947-2341	FRESENIUS MEDICAL CARE FRESENIUS	Profit	10
	MATTHEWS	NC	28105	MECKLENBURG	(704) 443-2973	MEDICAL CARE	Profit	31



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
MAYLAND DIALYSIS CENTER	SPRUCE PINE	NC	28777	MITCHELL	(828) 766-8122	DAVITA	Profit	9
DIALYSIS CARE OF MONTGOMERY COUNTY INC	BISCOE	NC	27209	MONTGOMERY	(910) 428-4052	DAVITA	Profit	20
CARTHAGE DIALYSIS CARE OF MOORE COUNTY INC	CARTHAGE	NC	28327	MOORE	(910) 947-1052	DAVITA	Profit	12
SOUTHERN PINES DIALYSIS CENTER	PINEHURST	NC	28374	MOORE	(910) 295-2124	DAVITA	Profit	22
FMC SOUTH ROCKY MOUNT BMA OF ROCKY MOUNT INC	ROCKY MOUNT	NC	27803	NASH	(252) 442-1129	DAVITA FRESENIUS MEDICAL CARE FRESENIUS	Profit	12
FRESENIUS MEDICAL CARE OF SPRING HOPE	ROCKY MOUNT	NC	27804	NASH	(252) 443-9800	MEDICAL CARE FRESENIUS	Profit	40
TOTAL RENAL CARE OF NORTH CAROLINA, LLC	SPRING HOPE	NC	27882	NASH	(252) 478-4091	MEDICAL CARE	Profit	15
SE DIALYSIS WILMINGTON DAVITA FACILITY	WILMINGTON	NC	28412	NEW HANOVER	(910) 395-4856	DAVITA	Profit	12
CAPE FEAR DIALYSIS FRESENIUS MEDICAL CARE EAST	WILMINGTON	NC	28401	NEW HANOVER	(910) 343-0664	DAVITA	Profit	29
NORTHAMPTON COUNTY	WILMINGTON	NC	28405	NEW HANOVER	(910) 796-8684	DAVITA	Profit	32
TOTAL RENAL CARE OF NORTH CAROLINA LLC	CONWAY	NC	27820	NORTHAMPTON	(252) 585-0236	FRESENIUS MEDICAL CARE	Profit	18
TOTAL RENAL CARE OF NORTH CAROLINA, LLC	JACKSONVILLE	NC	28546	ONSLow	(910) 353-6888	DAVITA	Profit	30
TOTAL RENAL CARE OF NORTH CAROLINA, LLC	JACKSONVILLE	NC	28540	ONSLow	(910) 989-0157	DAVITA	Profit	18



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
CAROLINA DIALYSIS CARRBORO ELIZABETH CITY	CARRBORO	NC	27510	ORANGE	(919) 966-4359	FRESENIUS MEDICAL CARE	Non-Profit	41
DIALYSIS ALBERMARLE DIALYSIS SOUTHEASTERN	ELIZABETH CITY	NC	27909	PASQUOTANK	(252) 338-2217	DAVITA	Profit	24
DIALYSIS BURGAW	ELIZABETH CITY	NC	27909	PASQUOTANK	(252) 338-0151	DAVITA	Profit	12
SURF CITY DIALYSIS	BURGAW	NC	28425	PENDER	(910) 259-9925	DAVITA	Profit	22
ROXBORO DIALYSIS	HAMPSTEAD	NC	28443	PENDER	(910) 329-0706	DAVITA	Profit	10
FRESENIUS MEDICAL CARE OF AYDEN	ROXBORO	NC	27573	PERSON	(336) 598-5196	DAVITA	Profit	24
FRESENIUS MEDICAL CARE FARMVILLE	AYDEN	NC	28513	PITT	(252) 746-9622	FRESENIUS MEDICAL CARE	Profit	16
FMC DIALYSIS SERVICES EAST CAROLINA UNIVERSITY	FARMVILLE	NC	27828	PITT	(252) 753-0092	FRESENIUS MEDICAL CARE	Profit	10
GREENVILLE DIALYSIS CENTER	GREENVILLE	NC	27834	PITT	(252) 329-8000	FRESENIUS MEDICAL CARE	Profit	38
BMA OF ASHEBORO NORTH RANDOLPH DIALYSIS CENTER OF WAKE FOREST UNIVERSITY	GREENVILLE	NC	27834	PITT	(252) 752-1520	FRESENIUS MEDICAL CARE	Profit	51
DIALYSIS CARE OF RICHMOND COUNTY INC	ASHEBORO	NC	27205	RANDOLPH	(336) 318-0380	FRESENIUS MEDICAL CARE	Profit	46
SANDHILLS DIALYSIS FMC DIALYSIS SERVICES OF ROBESON COUNTY	HIGH POINT	NC	27263	RANDOLPH	(336) 434-8910	INDEPENDENT	Non-Profit	10
	HAMLET	NC	28345	RICHMOND	(910) 582-5822	DAVITA	Profit	26
	ROCKINGHAM	NC	28379	RICHMOND	(910) 895-9924	DAVITA	Profit	12
	FAIRMONT	NC	28340	ROBESON	(910) 628-6898	FRESENIUS MEDICAL CARE	Profit	23



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
FMC LUMBERTON DIALYSIS UNIT	LUMBERTON	NC	28358	ROBESON	(910) 738-2421	FRESENIUS MEDICAL CARE	Profit	35
FMC PEMBROKE RED SPRINGS DIALYSIS CENTER	PEMBROKE	NC	28372	ROBESON	(910) 522-7126	FRESENIUS MEDICAL CARE	Profit	15
TOTAL RENAL CARE OF NORTH CAROLINA, LLC	RED SPRINGS	NC	28377	ROBESON	(910) 843-9311	FRESENIUS MEDICAL CARE	Profit	12
ST PAULS DIALYSIS CENTER	RED SPRINGS	NC	28377	ROBESON	(910) 843-3205	DAVITA	Profit	10
FRESENIUS MEDICAL CARE ST PAULS DIALYSIS CARE OF ROCKINGHAM COUNTY INC	SAINT PAULS	NC	28384	ROBESON	(910) 865-8440	DAVITA FRESENIUS	Profit	10
REIDSVILLE DIALYSIS ROCKINGHAM KIDNEY CENTER	ST PAULS	NC	28358	ROBESON	(910) 865-3086	MEDICAL CARE	Profit	20
DIALYSIS OF KANNAPOLIS DIALYSIS CARE OF ROWAN COUNTY INC	EDEN	NC	27288	ROCKINGHAM	(336) 623-7906	DAVITA	Profit	23
DAVITA DIALYSIS OF RUTHERFORD COUNTY INC	REIDSVILLE	NC	27320	ROCKINGHAM	(336) 348-6857	DAVITA FRESENIUS	Profit	27
BMA OF CLINTON INC SAMPSON COUNTY HOME TRAINING	REIDSVILLE	NC	27320	ROCKINGHAM	(336) 616-1611	MEDICAL CARE	Profit	19
	KANNAPOLIS	NC	28081	ROWAN	(704) 933-0809	DAVITA	Profit	19
	SALISBURY	NC	28144	ROWAN	(704) 637-2107	DAVITA	Profit	29
	FOREST CITY	NC	28043	RUTHERFORD	(828) 248-3660	DAVITA FRESENIUS	Profit	30
	CLINTON	NC	28328	SAMPSON	(910) 592-1600	MEDICAL CARE	Profit	33
	CLINTON	NC	28328	SAMPSON	(910) 590-2777	DAVITA	Profit	5



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
FMC ROSEBORO DIALYSIS	ROSEBORO	NC	28382	SAMPSON	(910) 525-0405	FRESENIUS MEDICAL CARE	Profit	13
FRESENIUS MEDICAL CARE SCOTLAND COUNTY DIALYSIS	LAURINBURG	NC	28353	SCOTLAND	(910) 277-3592	FRESENIUS MEDICAL CARE	Profit	14
FMCNA LAURINBURG DIALYSIS CENTER	LAURINBURG	NC	28352	SCOTLAND	(910) 276-6669	FRESENIUS MEDICAL CARE	Profit	30
BMA ALBEMARLE KING DIALYSIS CENTER OF WAKE FOREST UNIVERSITY	ALBEMARLE	NC	28001	STANLY	(704) 982-6945	FRESENIUS MEDICAL CARE	Profit	26
ELKIN DIALYSIS CENTER OF WAKE FOREST UNIVERSITY	KING	NC	27021	STOKES	(336) 985-3531	WAKE FOREST UNIVERSITY	Non-Profit	17
MOUNT AIRY DIALYSIS CENTER OF WAKE FOREST UNIVERSITY	ELKIN	NC	28621	SURRY	(336) 527-4722	WAKE FOREST UNIVERSITY	Non-Profit	19
CHEROKEE DIALYSIS CENTER	MOUNT AIRY	NC	27030	SURRY	(336) 789-4090	WAKE FOREST UNIVERSITY	Non-Profit	27
TOTAL RENAL CARE OF NORTH CAROLINA, LLC	CHEROKEE	NC	28719	SWAIN	(828) 497-6866	DAVITA	Profit	20
MARSHVILLE DIALYSIS CENTER	BREVARD	NC	28712	TRANSYLVANIA	(828) 884-4075	DAVITA	Profit	9
METROLINA KIDNEY CENTER MONROE UNION COUNTY	MARSHVILLE	NC	28103	UNION	(704) 624-5000	DAVITA	Profit	12
VANCE COUNTY DIALYSIS	MONROE	NC	28112	UNION	(704) 289-8407	FRESENIUS MEDICAL CARE	Profit	21
VANCE COUNTY DIALYSIS	MONROE	NC	28112	UNION	(704) 225-0944	DAVITA	Profit	28
VANCE COUNTY DIALYSIS	HENDERSON	NC	27536	VANCE	(252) 492-4239	DAVITA	Profit	33



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
KERR LAKE DIALYSIS FRESENIUS MEDICAL CARE APEX	HENDERSON	NC	27537	VANCE	(252) 431-0233	DAVITA FRESENIUS	Profit	16
CARY KIDNEY CENTER FUQUAY VARINA KIDNEY CENTER	CARY	NC	27511	WAKE	(919) 462-0976	MEDICAL CARE FRESENIUS	Profit	28
FMCNA SOUTHWEST WAKE DIALYSIS FMC WAKE DIALYSIS CLINIC	FUQUAY VARINA	NC	27526	WAKE	(919) 552-1926	MEDICAL CARE FRESENIUS	Profit	22
FMS SIX FORKS DIALYSIS CLINIC WAKE FOREST DIALYSIS CENTER	RALEIGH	NC	27603	WAKE	(919) 771-1022	MEDICAL CARE FRESENIUS	Profit	28
FMC NEW HOPE DIALYSIS RALEIGH DIALYSIS CLINIC INC	RALEIGH	NC	27609	WAKE	(919) 876-7501	MEDICAL CARE FRESENIUS	Profit	40
FRESENIUS MEDICAL CARE CENTRAL RALEIGH	RALEIGH	NC	27613	WAKE	(919) 781-8974	MEDICAL CARE	Profit	16
FMC EASTERN WAKE FRESENIUS MEDICAL CARE NORTHERN WAKE	RALEIGH	NC	27614	WAKE	(919) 556-0968	DAVITA FRESENIUS	Profit	22
BMA OF ZEBULON INC FMC DIALYSIS SERVICES OF WARREN HILLS	RALEIGH	NC	27610	WAKE	(919) 231-3700	MEDICAL CARE FRESENIUS	Profit	36
	RALEIGH	NC	27610	WAKE	(919) 231-3146	MEDICAL CARE	Profit	43
	RALEIGH	NC	27604	WAKE	(919) 832-2644	FRESENIUS MEDICAL CARE FRESENIUS	Profit	19
	ROLESVILLE	NC	27571	WAKE	(919) 554-1752	MEDICAL CARE FRESENIUS	Profit	14
	WAKE FOREST	NC	27587	WAKE	(919) 554-2359	MEDICAL CARE FRESENIUS	Profit	13
	ZEBULON	NC	27597	WAKE	(919) 269-8889	MEDICAL CARE FRESENIUS	Profit	30
	WARRENTON	NC	27589	WARREN	(252) 257-0420	MEDICAL CARE	Profit	25



Facility Name	City	State	Zip	County	Phone Number	Chain Organization	Profit or Non-Profit	# of Dialysis Stations
FMC DIALYSIS SERVICES PLYMOUTH	PLYMOUTH	NC	27962	WASHINGTON	(252) 793-6300	FRESENIUS MEDICAL CARE	Profit	14
FRESENIUS MEDICAL CARE WATAUGA COUNTY	BOONE	NC	28607	WATAUGA	(828) 268-7502	FRESENIUS MEDICAL CARE	Non-Profit	14
GOLDSBORO DIALYSIS GOLDSBORO SOUTH	GOLDSBORO	NC	27534	WAYNE	(919) 734-1410	DAVITA	Profit	26
DIALYSIS RAI CARE CENTERS GOLDSBORO	GOLDSBORO	NC	27530	WAYNE	(919) 739-6505	DAVITA	Profit	22
GOLDSBORO MOUNT OLIVE DIALYSIS WILKES REGIONAL	GOLDSBORO	NC	27530	WAYNE	(919) 734-0044	FRESENIUS MEDICAL CARE	Profit	16
DIALYSIS CENTER WILKESBORO	MOUNT OLIVE NORTH	NC	28365	WAYNE	(919) 658-0878	DAVITA	Profit	15
FOREST HILLS DIALYSIS WILSON	WILKESBORO	NC	28659	WILKES	(336) 903-6809	INDEPENDENT	Non-Profit	24
WILSON DIALYSIS YADKIN DIALYSIS	WILSON	NC	27893	WILSON	(252) 291-8417	DAVITA	Profit	21
CENTER OF WAKE FOREST UNIVERSITY	WILSON	NC	27893	WILSON	(252) 206-1471	DAVITA	Profit	40
YADKINVILLE	YADKINVILLE	NC	27055	YADKIN	(336) 677-1182	WAKE FOREST UNIVERSITY	Profit	13



APPENDIX B - SQUARE MILES PER DIALYSIS UNIT AND POVERTY LEVELS

County	Poverty	Population	PovLevel	Dialfacility	SqMiles	Pop per sqmi	SqMiles per dial center
Alamance	18.3	159,688	0.183	5	423.94	376.68	84.788
Alexander	17.2	37,428	0.172	1	259.99	143.96	259.99
Alleghany	19.8	10,848	0.198	0	235.06	46.15	0
Anson	24.2	25,448	0.242	2	531.45	47.88	265.725
Ashe	21.1	26,924	0.211	0	426.14	63.18	0
Avery	18	17,516	0.18	0	247.09	70.89	0
Beaufort	21	47,526	0.21	1	827.19	57.45	827.19
Bertie	23.4	19,854	0.234	1	699.27	28.39	699.27
Bladen	25.8	33,741	0.258	2	874.33	38.59	437.165
Brunswick	16.6	126,953	0.166	4	846.97	149.89	211.7425
Buncombe	17.1	256,088	0.171	3	656.67	389.98	218.89
Burke	20	88,851	0.2	1	507.1	175.21	507.1
Cabarrus	13.2	201,590	0.132	2	361.75	557.26	180.875
Caldwell	19.5	81,449	0.195	1	471.57	172.72	471.57
Camden	6	10,418	0.06	0	240.56	43.31	0
Carteret	14.4	68,890	0.144	2	506.25	136.08	253.125
Caswell	22.6	22,910	0.226	0	424.92	53.92	0
Catawba	15.2	156,459	0.152	3	398.72	392.40	132.9067
Chatham	12.4	72,243	0.124	2	682.19	105.90	341.095
Cherokee	17.9	27,905	0.179	1	455.43	61.27	455.43
Chowan	29	14,383	0.29	1	172.47	83.39	172.47
Clay	24.3	10,915	0.243	0	214.75	50.83	0
Cleveland	19.3	97,144	0.193	4	464.25	209.25	116.0625
Columbus	25	56,505	0.25	2	937.29	60.29	468.645
Craven	16.6	103,445	0.166	2	708.96	145.91	354.48



County	Poverty	Population	PovLevel	Dialfacility	SqMiles	Pop per sqmi	SqMiles per dial center
Cumberland	17	327,127	0.17	4	652.32	501.48	163.08
Currituck	9.8	25,809	0.098	0	261.85	98.56	0
Dare	8.8	35,964	0.088	1	383.42	93.80	383.42
Davidson	16.3	164,926	0.163	2	552.68	298.41	276.34
Davie	13.4	42,013	0.134	1	264.11	159.07	264.11
Duplin	26.3	58,969	0.263	3	816.22	72.25	272.0733
Durham	18.5	306,212	0.185	9	285.98	1070.75	31.77556
Edgecombe	25.2	53,318	0.252	2	505.34	105.51	252.67
Forsyth	18.6	371,511	0.186	5	408.15	910.23	81.63
Franklin	16.1	64,705	0.161	3	491.68	131.60	163.8933
Gaston	17.9	216,965	0.179	4	356.03	609.40	89.0075
Gates	19.6	11,478	0.196	0	340.45	33.71	0
Graham	21.1	8,558	0.211	0	292.08	29.30	0
Granville	15.4	59,031	0.154	2	531.57	111.05	265.785
Greene	23.3	21,168	0.233	1	265.93	79.60	265.93
Guilford	18.1	521,330	0.181	7	645.7	807.39	92.24286
Halifax	27.4	51,766	0.274	2	724.09	71.49	362.045
Harnett	17.2	130,881	0.172	4	594.99	219.97	148.7475
Haywood	16.6	60,682	0.166	1	553.69	109.60	553.69
Henderson	14.1	114,209	0.141	1	373.07	306.13	373.07
Hertford	26	24,136	0.26	1	353.06	68.36	353.06
Hoke	22.9	53,262	0.229	1	390.74	136.31	390.74
Hyde	25.6	5,517	0.256	0	612.7	9.00	0
Iredell	13.8	172,916	0.138	5	573.83	301.34	114.766
Jackson	21.8	42,241	0.218	1	490.76	86.07	490.76
Johnston	17.2	191,450	0.172	3	791.3	241.94	263.7667



County	Poverty	Population	PovLevel	Dialfacility	SqMiles	Pop per sqmi	SqMiles per dial center
Jones	16.7	9,845	0.167	1	470.71	20.92	470.71
Lee	18.9	59,616	0.189	2	254.96	233.82	127.48
Lenoir	23.7	57,307	0.237	2	400.59	143.06	200.295
Lincoln	15.6	81,168	0.156	1	297.94	272.43	297.94
Macon	21.3	34,376	0.213	1	515.56	66.68	515.56
Madison	17.3	21,340	0.173	0	449.57	47.47	0
Martin	23.2	23,172	0.232	1	461.22	50.24	461.22
McDowell	21.9	45,075	0.219	1	440.61	102.30	440.61
Mecklenburg	15.4	1,054,835	0.154	20	523.84	2013.66	26.192
Mitchell	18.3	15,126	0.183	1	221.43	68.31	221.43
Montgomery	25.6	27,418	0.256	1	491.76	55.75	491.76
Moore	15.6	95,776	0.156	3	697.84	137.25	232.6133
Nash	17	94,005	0.17	3	540.41	173.95	180.1367
New Hanover	16.9	223,483	0.169	3	191.53	1166.83	63.84333
Northampton	26.3	20,000	0.263	1	536.59	37.27	536.59
Onslow	15.2	187,136	0.152	2	762.74	245.35	381.37
Orange	17.8	141,796	0.178	1	397.96	356.31	397.96
Pamlico	13.8	12,821	0.138	0	336.54	38.10	0
Pasquotank	18.4	39,864	0.184	2	226.88	175.71	113.44
Pender	19.3	59,090	0.193	2	869.8	67.94	434.9
Perquimans	20.2	13,335	0.202	0	247.09	53.97	0
Person	18	39,284	0.18	1	392.32	100.13	392.32
Pitt	24.3	177,220	0.243	4	651.98	271.82	162.995
Polk	16.7	20,334	0.167	0	237.79	85.51	0
Randolph	17.8	143,416	0.178	2	782.52	183.27	391.26
Richmond	25.9	44,939	0.259	2	473.82	94.84	236.91



County	Poverty	Population	PovLevel	Dialfacility	SqMiles	Pop per sqmi	SqMiles per dial center
Robeson	31.7	133,235	0.317	7	949.22	140.36	135.6029
Rockingham	17.9	91,393	0.179	3	565.55	161.60	188.5167
Rowan	18.8	139,933	0.188	2	511.37	273.64	255.685
Rutherford	21.5	66,421	0.215	1	564.15	117.74	564.15
Sampson	22.8	63,124	0.228	3	944.74	66.82	314.9133
Scotland	32.3	35,244	0.323	2	318.85	110.53	159.425
Stanly	16.1	60,791	0.161	1	395.09	153.87	395.09
Stokes	15.8	46,097	0.158	1	448.86	102.70	448.86
Surry	19.9	72,113	0.199	2	532.17	135.51	266.085
Swain	27.2	14,346	0.272	1	528	27.17	528
Transylvania	14.3	33,482	0.143	1	378.53	88.45	378.53
Tyrrell	20.8	4,141	0.208	0	389.04	10.64	0
Union	9.4	226,606	0.094	3	631.52	358.83	210.5067
Vance	28	44,244	0.28	2	253.52	174.52	126.76
Wake	11	1,046,791	0.11	13	835.22	1253.31	64.24769
Warren	26.2	19,907	0.262	1	428.46	46.46	428.46
Washington	23.7	12,195	0.237	1	348.14	35.03	348.14
Watauga	31.3	53,922	0.313	1	312.56	172.52	312.56
Wayne	22.1	124,150	0.221	4	553.09	224.47	138.2725
Wilkes	22.7	68,740	0.227	1	754.28	91.13	754.28
Wilson	23.2	81,661	0.232	2	368.17	221.80	184.085
Yadkin	18.5	37,532	0.185	1	334.83	112.09	334.83
Yancey	20.1	17,678	0.201	0	312.6	56.55	0



APPENDIX C - PUBLICATIONS, PRESENTATIONS, POSTERS RESULTING FROM THIS PROJECT

- [1] Lind, M.R. and Hensley, R.L. 2017. “Public Dialysis Transport Efficiency Using Digital Media”, CATM Symposium, October 10, 2017
- [2] Lind, M. and Hensley, R. 2018. “Public Dialysis Transport Efficiency Using Digital Media”. Presentation at the Hawaii International Conference on System Sciences, Hilton Waikoloa Village, Big Island, Jan. 2-6, presentation.
- [3] Hensley, R.L. & Lind, M.R., 2017. “A Preliminary Examination of Public Dialysis Transport Efficiency Using Available Technologies”, Southeast Decision Sciences Institute Meeting, presentation and publication in proceeding, Wilmington, NC, February 22, 2018, p. 1-12.
- [4] Lind, M. and Hensley, R. 2018. “Public Dialysis Transport Efficiency Using Digital Media”. Presentation to the North Carolina A&T State University College of Business and Economics Brownbagger’s Group, Feb. 26, presentation.