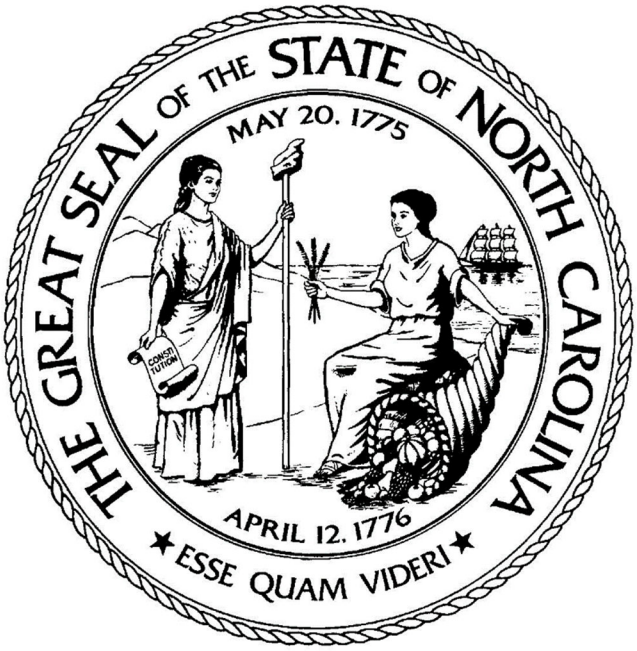
Adult and Pediatric Traumatic Brain Injury Pilot Program

Session Law 2021-180, Section 9F.7.(c)



Report to

The Joint Legislative Oversight Committee on Health Human

and

The Fiscal Research Division

August 17, 2022

Background

Session Law (S.L.) 2021-180, Section 9F.7.(a) mandated the Department of Health and Services (DHHS), Division of Mental Health, Developmental Disabilities and Substance Abuse Services (DMH/DD/SAS) resume the adult and pediatric traumatic brain injury pilot program (TBI pilot program) previously authorized by S.L. 2017-57, Section 11F.9, as amended by S.L. 2017-212, Section 3.3. S.L. 2021-180, Sec. 9F.7.(c). The 2021 sessional law also required that no later than April 1, 2022, DMH/DD/SAS shall submit a report on the TBI pilot program to the Joint Legislative Oversight Committee on Health and Human Services and the Fiscal Research Division that includes, at a minimum, all of the following:

1. The number and outcome of patients served at each program site, broken down by patient age and county of origin.
2. A breakdown of expenditures at each program site by type of service.
3. An estimate of the cost to expand the program incrementally and statewide.
4. An estimate of any potential savings of State funds associated with expansion of the program.
5. If expansion of the TBI pilot program is recommended, a timeline and plan for expanding the program.

Progress Report

S.L. 2017-212, Sec. 3.3 required DMH/DD/SAS to establish an adult and pediatric TBI pilot program to be conducted at not less than three, but not more than five trauma hospitals licensed in the State. The law directed DMH/DD/SAS to contract with a private entity to assist participating trauma hospitals in implementing pilot programs to include an interactive quality assessment and quality assurance clinical decision support tool to provide real time, evidence based medical care guidance for intensive care unit patients with severe adult or pediatric traumatic brain injury. The purpose of the program was to increase compliance with internationally approved, evidence-based treatment guidelines for severe adult and pediatric traumatic brain injury in order to reduce patient mortality, improve patient level of recovery, and reduce long-term care costs. Following a Request for Proposals, Qmetis, a healthcare technology firm grounded in the science of evidence-based medicine, was awarded the contract to manage North Carolina's TBI program in 2019. Qmetis builds clinical decision-support tools for hospitals and their teams that place the latest evidence-based treatment guidelines at the patient bedside fast, interactively and easily, where the greatest difference in patient cost and outcomes can be achieved. The organization continued to work in North Carolina hospitals in FY 2020 and FY 2021 without a state-approved budget.

(1) The number and outcome of patients served at each program site, broken down by patient age and county of origin.

Qmetis has obtained the agreements from four North Carolina trauma centers, (Vidant, WakeMed, WakeBaptist and Atrium) to participate in the TBI pilot program. Two of these trauma centers, (WakeMed and Vidant) are now active participants. The COVID-19 pandemic slowed the launch of new initiatives in some hospitals. In addition, Atrium acquired/merged with WakeBaptist and that specific merger resulted in internal administrative delays on their end. Atrium is also changing its internal technology platform.

As of January 2022, 89 North Carolina TBI patients have been treated with the aid of the Qmetis program and software. The following tables provide a breakdown of the data regarding those patients and hospitals. Tables 1-3 reflect data from Wake-Med, located in Wake County; Tables 4-6 reflects data from Vidant Medical Center, located in Pitt County.

Table 1: WakeMed TBI Patient Data: Age

Age	Patient Total	Percent of Total
0-9	6	8%
10-19	4	6%
20-29	3	4%
30-39	15	21%
40-49	2	3%
50-59	5	7%
60-69	1	1%
70-79	2	3%
80-89	2	3%
Unknown	29	41%
90+	2	3%
Totals	**71**	**100%**

Table 2: WakeMed TBI Patient Data: Gender

Gender	Patient Total	Percent of Total
Female	15	21%
Male	56	79%
Totals	**71**	**100%**

Table 3: WakeMed, Raleigh-Durham / TBI Patient Data: Cause of Injury

Cause of Injury	Patient Total	Percent of Total
Auto	51	72%
Fall	5	7%
Unknown	3	4%
Assault	3	4%
Other	2	3%
Recreational Vehicle	1	1%
Motorcycle	5	7%
Pedestrian	1	1%
Totals	**71**	**100%**

Table 4: Vidant Medical Center / TBI Patient Data: Age

Age	Patient Total	Percent of Total
0-9	9	50%
10-19	2	11%
20-29	0	0%
30-39	4	22%
40-49	0	0%
50-59	1	6%
60-69	0	0%
70-79	1	6%
80-89	0	0%
90+	1	6%
Totals	**18**	**100%**

Table 5: Vidant Medical Center / TBI Patient Data: Gender

Gender	Patient Total	Percent of Total
Female	9	50%
Male	9	50%
Totals	**18**	**100%**

Table 6: Vidant Medical Center / TBI Patient Data: Cause of Injury

Cause of Injury	Patient Total	Percent of Total
Auto	10	56%
Pedestrian	5	28%
Fall	2	11%
Motorcycle	1	6%
Totals	**18**	**100%**

Patient Outcomes

Qmetis has committed to retaining, at its own expense, the services of an independent actuarial firm or health economic outcomes research firm, (HEOR), to measure the performance of the program, patient outcomes, and cost savings to the State. The review and selection process for such a firm is underway. Thus, it is too soon to provide data on patient outcomes despite the fact that the participating hospitals involved have seen increases in guideline compliance over time that the recent medical literature correlates to lower cost of care and improved outcomes.

Qmetis preliminarily estimates that, with the number of TBI patients (89) already treated, the cost of this program has already been reimbursed to the State with the likelihood of savings achieved. This is based upon recruiting the additional hospitals into the program, staff training of those clinical / trauma teams, software integrations, software customizations as may be requested, ongoing staff training and reporting. Independent reporting is expected to confirm this.

(2) A breakdown of expenditures at each program site by type of service.

Through February 28, 2022, this program has not been funded by the State. Qmetis has self-funded this effort; therefore, there is no breakdown of State expenditures at this time.

(3) An estimate of the cost to expand the program incrementally and statewide.

The current effort targeting three to five North Carolina trauma centers is funded at the level of $300,000 for FY 2022 and $300,000 for FY 2023. Treatment of TBI requires trained neurosurgical staff or trauma staff. As such, TBI should be treated in a Level 1 or Level 2 Trauma hospital as these facilities will have a full neurosurgical team. There are eight of these trauma centers in North Carolina. Expanding the current pilot program to include the additional trauma centers not committed to the current program would cost an additional $175,000 per fiscal year for a total of $475,000 per fiscal year for a statewide expansion.

(4) An estimate of any potential savings of State funds associated with expansion of the program.

Two of the largest costs drivers of any state-funded health care effort are Medicaid and long-term care. The same is true for traumatic brain injury. There is ample evidence in the medical literature that shows the implementation of evidence-based guidelines improves TBI patient outcomes reducing mortality by 50% and improving functional outcome by 50% while reducing acute care costs by 20%. Naturally, improving functional outcomes would reduce long-term care costs delivered often through Medicaid.

North Carolina

Based on North Carolina's population and previous injury incidences estimated by the U.S. Center for Disease Control, (CDC), North Carolina may see approximately 6,651 severe TBI cases each year. Many of these cases will be served by the Medicaid population over the long course of their care. Models developed by Qmetis aim to get a better understanding of traumatic brain injury at the state level. Specifically, the agency uses an estimate of TBI cases in each state based upon CDC-incidence and a state's total population; the percentage of cases that normally end-up in the Intensive Care Unit (ICU) as well as the percentage of those that end-up in long-term care (LTC); industry values on acute care and long-term care costs; the state's Medicaid eligible population; the number of cases of severe TBI from the Medicaid population; and the number of estimated long-term care cases from the Medicaid eligible population. It then allows for federal matching funds and then arrives at an estimated state TBI cost. A projected savings of 20% on LTC costs is used as this has been the result of multiple independent studies on the higher use of evidence-based medicine in TBI acute care.

Below is a more detailed look at a Qmetis model for TBI in North Carolina utilizing state population data, Medicaid eligible data, cost of acute and long-term care of the TBI patient, estimates of the number of TBI cases who require long-term care, while accounting for Federal matching funds. All of the numbers provided below are estimates resulting solely from research conducted by Qmetis.

Population of North Carolina (approximate)	10,490,960
Incidence of Severe Cases* (Based on CDC Estimates of 634 Per Million)	6,651
Incidence per week	127
Incidence per day	17
Estimated Annual TBI Cost in North Carolina (Includes Federal Match)	$1,852,074,656
People Eligible for Medicaid (Est.)	1,353,000
Projected Annual TBI Patients From Eligible Medicaid Population	8,559
Estimated Annual Total Cost of Care in North Carolina TBI Patients (Medicaid Only) (Includes Federal Match)	$226,082,006
* A Glasgow Coma Score of 8 or below. The Glasgow Coma Scale is an international measure to gauge the severity of a traumatic brain injury ranging from 3 to 13 with the lower number indicating a more severe condition.	

Section Summary

Due to the high cost of long-term care, the diversion of just one TBI case in each year in North Carolina from long-term care would fully fund a statewide program roll-out. Independent studies over the past 20 years have all shown long term care savings of 20% or higher when evidence-based care is followed in the acute care phase of traumatic brain injury cases. Diversion is dependent upon the patient condition at discharge. Qmetis's work in TBI is focused on the acute care / intensive care unit phase of care. Qmetis does not directly capture where a patient is discharged to.

(5) If expansion of the TBI pilot program is recommended, a timeline and plan for expanding the program.

Recruiting and onboarding a large, hospital-based trauma center into a program in North Carolina's Traumatic Brain Injury Program is a 6-to-9-month process. Once contracted for and funded, Qmetis estimates that within that 9-month period all North Carolina level 1 and level 2 trauma hospitals could be program participants (assuming a willingness to participate exists) and a statewide traumatic brain injury program would be in place. The plan for such an expansion follows the same plan that successfully launched the pilot phase. If requested, the Department of Health and Services, Division of Mental Health, Developmental Disabilities and Substance Abuse Services will provide status reports regarding the progress of the continued work with this innovative and important pilot.