REPORT TO THE THIRTY- SECOND LEGISLATURE

STATE OF HAWAI'I
2023

PURSUANT TO SECTION 321H-4
HAWAI'I REVISED STATUTES

REQUIRING THE DEPARTMENT OF HEALTH TO PROVIDE AN ANNUAL REPORT ON THE ACTIVITIES UNDER THE NEUROTRAUMA SPECIAL FUND

PREPARED BY:
STATE OF HAWAI'I
DEPARTMENT OF HEALTH

December 2022

EXECUTIVE SUMMARY

In accordance with the provisions of Section 321H-4, Hawai'i Revised Statutes (HRS), "Neurotrauma," the Department of Health (DOH), Developmental Disabilities Division (DDD), Neurotrauma Program respectfully submits this annual report on the activities of the Neurotrauma Special Fund (NSF).

The NSF was established for the DOH to "develop, lead, administer, coordinate, monitor, evaluate and set direction for a comprehensive system for survivors of neurotrauma injuries." Since January 2003, the NSF is funded by surcharges from neurotrauma-related traffic citations that are deposited into the NSF. The Neurotrauma Program continues to work with neurotrauma survivors and their families to identify priorities for expenditure of moneys that are available in the NSF. The Neurotrauma Advisory Board (NTAB) and the Traumatic Brain Injury Advisory Board (TBIAB) provide stakeholder input into the Neurotrauma Program's activities. Additionally, NTAB offers advisory recommendations regarding the special fund. Based on the feedback received from neurotrauma survivors and stakeholders, the highest priorities of the NSF expenditures for FY 2021-2023 are to educate survivors, caregivers, parents, and educators of youth on the signs, symptoms, resources, and effects of a neurotrauma injury. Stakeholders also expressed a need for hospital staff to link survivors and caregivers to tools when a survivor transitions back into the community.

During FY 2022, the Neurotrauma Program worked on meeting the goals and objectives of the Hawaii 2021-2023 Neurotrauma Program Strategic Plan (Attachment II). Program staff implemented activities to use the NSF in accordance with the mandate of Section 321H-4, HRS, in collaboration with the NTAB, TBIAB, Brain Injury Association of Hawai'i, families, survivors, and other community stakeholders. The Neurotrauma Program also obtained stakeholder feedback through the Data, Education, and Survivor Subcommittees to address the goals and objectives outlined in the FY 2021-2023 Neurotrauma Program Strategic Plan.

Section 321H-4, HRS mandates the NSF be used for a "registry of neurotrauma injuries within the state". The Hawaii Neurotrauma Registry (HNTR) gathers information on the long-term service and support needs of survivors of neurotrauma injuries and their family members. A previous contract to administer the HNTR ended in May 2020. The Neurotrauma Program worked with the Data Subcommittee to explore different options for continuing the HNTR that would ensure the data collected is a valid representation of the needs of all survivors in Hawaii statewide. No viable options were identified, and subsequently, the Neurotrauma Program developed a Request for Information (RFI) to solicit information on other methods to implement the HNTR. Based on responses to the RFI it was determined that Neurotrauma Program needs to consider alternative methods of data collection for the HNTR. The Neurotrauma Program is currently collecting stroke and traumatic brain injury (TBI) data through the Behavioral Risk Factor Surveillance System.

In FY 2023 a new approach employing widely available technology is being explored as a tool to build the HNTR. Besides contributing to the HNTR database, this technology offers neurotrauma survivors a way to help themselves function more seamlessly in their daily lives.

The Neurotrauma Program supported:

- **Project RAPID Hawaii: A Statewide Collaboration on Acute Stroke Care** with the Queen's Medical Center (QMC) to oversee and assist with the installation, implementation, and training of frontline staff on the RAPID Computerized Tomography (CT) perfusion (RAPID) software at six (6) acute care Hawaii hospitals. The most validated use of the

RAPID software is to determine eligibility for a minimally invasive procedure called Mechanical Thrombectomy (MT) in patients experiencing large vessel occlusion (LVO) strokes. LVOs, if left untreated, have the highest rate of mortality or severe disability. Clinical trials demonstrated that MT dramatically increased chances of survival with independent level of function. The RAPID software can also be used to identify patients with wake-up strokes or strokes with unwitnessed onset who would be beyond the four and a half (4.5) hour treatment window from time-last-known-well for tissue plasminogen activator (tPA) treatment and to exclude tPA treatment in patients with suspected stroke mimics, such as those with seizure, complicated migraine, or psychogenic response.

Initial project implementation was delayed due to the COVID-19 pandemic. However, in FY 2022, the RAPID software was installed and is currently operating at five (5) of the six (6) hospitals. All suspected stroke patients received a RAPID scan from the time of software implementation at each hospital, and a total of two-thousand fifty-eight (2,058) RAPID scans were successfully processed. As a result of the RAPID software, fourteen (14) patients were identified as eligible for MT, seventy-two (72) patients were given clot buster medications Tissue Plasminogen Activator (tPA) or Tenecteplase (TNK), and three hundred and fifty-five (355) patients were identified as not benefitting from MT and remained at their local hospital, avoiding an unnecessary transfer. The remaining patients either had completed strokes or were not eligible for MT or clot buster medications. The proportion of those identified as eligible for MT was as expected, given that fifteen percent (15%) of strokes are LVOs and only a fraction of those are eligible for MT.

- **Project Head, Neck, Spine** with the University of Hawai'i, Kinesiology and Rehabilitation Services Department (UH-KRS) developed, piloted, and launched an online educational health resource aimed at educating students in grades two (2) through twelve (12) on head, neck, and spine injuries, including recognition, awareness, and prevention. Outreach was extended to homeschooled students and families. The project has expanded by developing, piloting, and launching an online educational resource for educators on awareness and recognition of head, neck, and spine injuries, and "Return-to-Learn" protocol on how to appropriately support students on their return to the classroom after a head injury.

During FY 2023, the Neurotrauma Program will continue to gain community input through TBIAB, NTAB, Strategic Plan subcommittees and community organizations to meet goals consistent with Section 321H-4, HRS. The Neurotrauma Program will continue its efforts to collect and analyze data, raise awareness to prevent disabilities, educate and disseminate information on traumatic brain injury (TBI), spinal cord injury (SCI), and stroke to survivors and their families, and implement the Neurotrauma Program Strategic Plan for FY 2021-2023 to improve the statewide system of services and supports for individuals living with neurotrauma in Hawai'i.

REPORT TO THE LEGISLATURE
IN COMPLIANCE WITH SECTION 321H-4, HAWAI'I REVISED STATUTES

Introduction

Pursuant to Section 321H-4, HRS, the DOH-DDD Neurotrauma Program respectfully submits this annual report on the activities of the Neurotrauma Special Fund (NSF) to the Thirty-Second Legislature.

Section 321H, HRS, mandates the DOH to "develop, lead, administer, coordinate, monitor, evaluate, and set direction for a comprehensive system to support and provide services for survivors of neurotrauma injuries;" to establish a Neurotrauma Advisory Board (NTAB); and to administer the NSF. The NSF began accumulating moneys from neurotrauma related traffic citation surcharges (speeding, drunk driving, not wearing seat belts, leaving the scene of an accident involving bodily injury) since January 1, 2003. This report is a status report on activities funded by the special fund for the period of July 1, 2021, to June 30, 2022.

Neurotrauma Advisory Board (NTAB) and Traumatic Brain Injury Advisory Board (TBIAB)

Section 321H, HRS was passed by the legislature in 2002. In compliance with the statute, the NTAB was established to advise the DOH on the use of the NSF to implement these statutes. In 1997, the legislature passed Act 333 that created the TBIAB to advise the DOH in the development and implementation of a comprehensive plan to address the needs of persons affected by disorders of the brain. As a subset of the NTAB, the TBIAB would continue to exist and advocate on behalf of the individuals affected by brain injury and would advise the DOH in consultation with the NTAB. In 2014, the Legislature amended Section 321H-3, HRS, to reduce NTAB membership from twenty-one (21) to eleven (11) members to obtain quorum while maintaining the same representation of members for the board. All members are appointed by the Director of Health and represent key stakeholder groups statewide. Board members participated in the development of the Neurotrauma Program Strategic Plan FY 2021-2023 to guide its work. Current members of the NTAB are listed in Attachment I.

Neurotrauma Program Strategic Plan FY 2021-2023

During FY 2022, the Neurotrauma Program worked to meet the goals and objectives defined in the Neurotrauma Program Strategic Plan for FY 2021-2023. Through TBIAB, NTAB, Data, Education, and Survivor Subcommittees, members provided input to the Neurotrauma Program on strategies to meet the goals and objectives. This Legislative Report provides highlights of how the Neurotrauma Program implemented activities to address the goals and objectives of the Strategic Plan during FY 2022.

Use of the Neurotrauma Special Fund

Section 321H-4, HRS, mandates that the NSF shall be used for:

- Education on neurotrauma;
- Assistance to individuals and families to identify and obtain access to services;
- Creation of a registry of neurotrauma injuries within the State to identify incidence, prevalence, individual needs, and related information; and
- Necessary administrative expenses to carry out this section not to exceed two percent (2%) of the total amount collected.

(1) Educational activities:

Consistent with the Neurotrauma Program Strategic Plan Goals 1 and 2, the Neurotrauma Program, in coordination with community partners, provided education on neurotrauma to the public and providers to increase awareness of the effects of neurotrauma and how to respond to an injury and to improve service delivery and outcomes for survivors of neurotrauma.

UH-KRS Educational Activities

The Neurotrauma Program funded UH-KRS's Project Head, Neck, Spine. During FY 2022, Project Head, Neck, Spine piloted their online educational resource for educators on awareness and recognition of head, neck, and spine injuries, and "Return-to-Learn" protocol on how to appropriately support students on their return to the classroom after a head injury. Additionally, UH-KRS onboarded one (1) new school to utilize the online educational resource and expanded the outreach to homeschooled students and families. Over three hundred six (306) students and homeschooled students were educated on head, neck, and spine injuries, recognition, awareness, and prevention during FY 2022.

Since the project began in 2017 a total of sixteen (16) elementary, middle, and high schools have utilized the resource. This includes nine (9) schools on Oahu, three (3) schools on Maui, one (1) school on Kauai, and two (2) schools on Hawaii Island. Multiple teachers have utilized the curriculum more than once with their new incoming classrooms. In this time a total of one thousand nine hundred (1900) students and homeschooled students were educated. The middle and high school students had a pre-test average of sixty-four-point nine percent (64.9%) and a post-test average of seventy-seven-point six percent (77.6%), indicating increased comprehension of the educational material. The lower grade level elementary students had a pre-test average of eighty percent (80%) and a post-test average of eighty percent (80%). There is limited upper grade level elementary evaluative data, but the project continues to onboard more students and homeschooled students at this level. In FY 2023, Project Head, Neck, Spine will continue to implement the online educational resource with additional schools, students, and homeschooled students.

QMC Educational Activities

The COVID-19 pandemic hindered efforts to provide the in-person F.A.S.T. Stroke Education Program at Department of Education schools during FY 2022. For this reason, QMC did not pursue in-person stroke education in schools during FY 2022 as was originally planned and carried out in the first two (2) years of the program. Instead, QMC undertook a series of on-line and in-person public education events to promote the recognition of the signs and symptoms of stroke and calling 9-1-1 to activate Emergency Medical Services. Through five (5) online community events and eleven (11) in-person community events held at local farmer's markets and pharmacies, QMC was able to engage with an estimated four hundred twenty (420) members of the community for stroke education.

As part of Project RAPID Hawaii, providers were educated on implementing the RAPID software to improve stroke care. Twenty-four (24) physicians, thirty (30) Emergency Department staff, and two (2) stroke coordinators were trained. Additional training is being conducted at all the hospitals using the online RAPID University training modules. Additional information on Project RAPID Hawaii is discussed below.

Hawaii Concussion Awareness and Management Program (HCAMP) Concussion Summit

The Neurotrauma Program was a sponsor for the 12th Annual HCAMP Concussion Summit,

which was held virtually on July 8-9, 2021, via Zoom. The July 8, 2021, session focused on innovations in concussion identification and recovery.

The July 9, 2021, session included a one (1) year update to HCAMP's 2020 Concussion Summit coverage of the effects of COVID 19 within the athletic community. Other topics included concussion assessment using COBALT and rehabilitation after injury. COBALT is a brief screening tool specifically developed to assess an athlete's ability to balance and can be used as part of a concussion management program. Using COBALT pre-season and post injury informs stakeholders of an athlete's condition and how to proceed with activities related to healing and play. Rehabilitation focused topics were comprised of how to implement exercises specific to facilitate recovery of concussed athletes and progressive training geared towards Return to Play.

Two hundred sixty-one (261) individuals from two (2) countries, including athletic trainers, physicians, nurses, physical therapists, speech language pathologists, and students attended the Summit. Eighty-five percent (85%) of attendees completed the post-conference evaluation. One hundred percent (100%) of evaluation respondents felt the program met its stated objectives, and ninety-eight percent (98%) indicated their professional practices would change due to information provided through the 2021 Concussion Summit.

Three (3) comments that illustrate the lasting impact of the 2021 Concussion Summit:
Physician – "I feel more comfortable discussing the current science of biomarkers, the potential and limitations, with patients."
Athletic Trainer – "Increase education for EMT's and coaches in my EAP for CSI with an emphasis on equipment removal and neutral spine. Utilizing the COBALT/Modified COBALT instead of the BESS for my baseline as well as post injury evaluation of my athletes."
PT or SLP – "Incorporate guidelines and emerging and existing evidence to inform clinical decision-making in multidisciplinary management of concussion symptoms."

Partnerships with Community Organizations and Neurotrauma Awareness Months

Consistent with Strategic Plan Objective 1.2, the Neurotrauma Program conducted activities to promote awareness of neurotrauma. Throughout FY 2022, the Neurotrauma Program partnered and/or participated in twenty (20) virtual and in-person community events and presentations statewide. Special events were held to recognize nationally designated months for Spinal Cord Injury, Stroke and Brain Injury Awareness. Event attendees were furnished with promotional products and educational materials related to neurotrauma. Information included education of signs, symptoms, and what to do when a TBI, SCI, or stroke occurs. At helmet events, attendees were educated on injury prevention, rules of the road, and offered a bicycle, multisport, or moped helmet free of charge. Over eight hundred (800) individuals from the general public as well as professionals received education on neurotrauma through these events. Table one (1) includes additional information on events and presentations.

Table 1. Community Outreach and Number Educated on Neurotrauma

Organization	Event	Number Educated
Leadership in Disabilities and Achievement of Hawai'i	Injury prevention/Helmet event	40
Catholic Charities Hale Malama	Falls and injury prevention	20
Queens Medical Center	Telestroke project	100
Maui Police Department	TBI presentation	40
Hokulani Elementary	Injury prevention/Helmet event	50
Wahiawa Hongwanji	Stroke presentation	15
Rotary Club(s) of Hawaii	Stroke presentations	30
Power of Patients	Educational Presentation	20
Hawaii Disability Rights Center	Educational Presentation	20
Core State Violence Injury Prevention Program	Educational Presentation	20
Iowa Family First	Educational Presentation	45
DOH Community Resources Branch	Stroke presentation	15
Lanakila Senior Center Members	Stroke presentation	25
Leeward Community College	Injury prevention/Helmet event	30
Drowning and Injury Prevention Advisory Committee	Beach Safety interview with three (3) different tv news	unknown
Rollerskate Oahu	Injury prevention/Helmet event	50
Taste of Oahu	Injury prevention/Helmet event	75
Light up the Night	Injury prevention/Helmet event	15
Hawaii Stroke Coalition	Stroke Awareness Education Subcommittee	200
Total: 810+		

The Neurotrauma Program recognized September as Spinal Cord Injury Awareness Month by teaming with Drowning and Aquatic Injury Prevention Advisory Committee (DAIPAC) August 21 – 28, 2021 to celebrate Beach Safety Week. The Neurotrauma Program arranged for firefighter Yurik Resetnikov turned spinal cord injury (SCI) ambassador to be interviewed as a part of the celebration. A DOH media advisory resulted in television interviews of Resetnikov sharing his story, advocating for safe water practices, and imparting hope to other SCI survivors.

KHON

KITV

Hawaii News Now

Scan the QR code or click on a picture to view TV coverage from Beach Safety Week.

Additionally, the Neurotrauma Program website linked to SCI tips on how to prevent an SCI, resources for survivors of SCI and their family members, and an activity page to increase knowledge on SCI.

For Brain Injury Awareness Month in March 2022, the Neurotrauma Program revived the Rock it, Don't Stock it campaign which originally debuted March 2020 at the University of Hawaii just prior to the COVID lockdown. Participating organizations for this recent event included the University of Hawai'i at Manoa College of Education, Hawaii Concussion Awareness Management Program, Queen's Medical Center, Kapiolani Medical Center, Hawai'i Bicycling League, Neuroscientist Dr. Sheri Hiroi-DuBay, Department of Transportation and Leeward Community College (LCC) where the event was held. Moped and bicycle helmets were furnished to attendees along with fun learning activities and information for injury prevention and living with a TBI.

HBL volunteers at Leeward Community College educated the public on bike, helmet, and road safety. Attendees were properly fitted for and given bike or multi-sport helmets free of charge.

Contact during highly attended events are typically brief, consisting of hard copy information and fleeting dialogue, to ensure all present would be served. As LCC was offering hybrid (in-person and online) classes participation for this event was lower than expected. However, all participating organizations expressed appreciation for the opportunity to dialogue, educate, and engage attendees more fully.

In recognition of Trauma Awareness Month, the Neurotrauma Program collaborated with Hawaii Bicycling League (HBL), University of Hawai'i at Manoa College of Education, Hawaii Concussion Awareness Management Program, Pacific Disabilities Center, Kapiolani Center for Women and Children, Rollerskate Oahu and Queen's Medical Center to promote injury prevention and use of a helmet for wheeled activities. Attendees to Taste of Oahu had a chance to test their bicycling skills and knowledge on the HBL bike course set up in the Aloha Stadium

parking lot. Additionally, individuals were treated to injury prevention information, helmet fittings, and a free helmet at Taste of Oahu, Rollerskate Oahu's Wonderland and Hawaii Bicycling League's Light Up the Night events. Attendees were also able to view masks designed by Hawaii brain injury survivors. Accompanying each mask is the artist's story detailing the symbolism of their creation.



Scan the QR code or click on a picture to view masks created by Hawaii TBI survivors and read their personal stories.

The Neurotrauma Program recognized Stroke Awareness Month in May 2022 by checking in with Lanakila Multipurpose Senior Center (LMPSC) seniors and DOH employees after one (1) year of the Neurotrauma Program's stroke prevention campaign which included a 2021 pledge identifying actions participants would take to reduce their stroke risk and quarterly stroke information emails. The visit included a review of general stroke information and a presentation by the Queens Medical Center stroke coordinator on Hawaii's stroke system of care.

Scan the QR code or click on the B.E.F.A.S.T. banner to watch the LMPSC stroke presentation.

A total of twenty-five (25) LMPSC members participated in the one (1) year check in which reflected most individuals maintaining their reported stroke risk from one (1) year ago, and one hundred percent (100%) reporting either a change in behavior to reduce stroke risk or a greater awareness of stroke including symptoms, responding to a stroke emergency and knowledge of activities to lower one's chances of experiencing a stroke.

Staff of Catholic Charities Hawaii, (CCH) who participated in the 2021 stroke awareness campaign were also due for a one (1) year check in. CCH pushed their check in to FY 2023 as their organization was engaged in a review for professional accreditation.

The Neurotrauma Program's impact extends beyond the direct contact of these events. Kona Brain Injury Support Group who is celebrating twenty-five (25) years of meeting, regularly hosts speakers that were discovered through a Neurotrauma Program educational event. The Iowa Family First event was a presentation on a collaborative effort between the Iowa Department of Public Health, Iowa Department of Human Services, and Brain Injury Alliance of Iowa looking at families involved with child welfare services and considering if a history of head injury was causing a barrier to success. Communication after this event resulted in the Iowa team successfully networking with Hawaii Family First and Keiki Injury Prevention Coalition. Through the Neurotrauma Program, public and professional organizations statewide have been provided

opportunities to educate their constituency and build upon their efforts to make Hawaii a better, stronger, more informed place to live.

(2) Assistance to individuals and families to identify and obtain access to service activities:

Project RAPID Hawaii: A Statewide Collaboration on Acute Stroke Care

October 2021 began the final year of a three (3) year contract with QMC to oversee and assist with the installation and implementation of the RAPID CT perfusion software at six (6) acute care Hawaii hospitals and training of frontline staff at these hospitals to use the software. The six (6) hospitals include Wahiawa General Hospital, Kona Community Hospital, Kauai Veterans Memorial Hospital, Hilo Medical Center, Castle Medical Center, and Kuakini Medical Center. The contract also funds the software licensing fees for each hospital from the installation date through September 2022. The hospitals are intended to assume funding the licensing fees after the DOH contract and funding ends.

Until 2015, the only proven treatment for ischemic stroke, which occurs when a blood vessel supplying blood to the brain is blocked by a clot, was intravenous (IV) tissue plasminogen activator (tPA), also known as clot buster medication. However, treatment with IV tPA alone has only a ten to thirty percent (10%-30%) success rate at fully restoring blood flow to the brain with large vessel occlusions (LVOs). LVOs, if left untreated, have the highest rate of mortality or severe disability. In 2018, several landmark clinical trials demonstrated that manual removal of the blockage within twenty-four (24) hours of symptom onset through a procedure called mechanical thrombectomy (MT) dramatically increases the chance of survival with independent level of functioning when patient eligibility is determined by advanced imaging studies that measure blood flow to the brain. The RAPID software can also be used to identify patients with wake-up strokes or unwitnessed onset, who would be beyond the four and a half (4.5) hour time window from time-last-known-well for tPA treatment and to exclude tPA treatment in patients with suspected stroke mimics, such as seizure, complicated migraine, or psychogenic response.

The goals of this project are to improve access for eligible patients at the six (6) remote hospitals to receive MT at tertiary hospitals that can perform this procedure; reduce the time and cost associated with on-site processing of RAPID CT perfusion imaging; and reduce the delay in treatment times for patients.

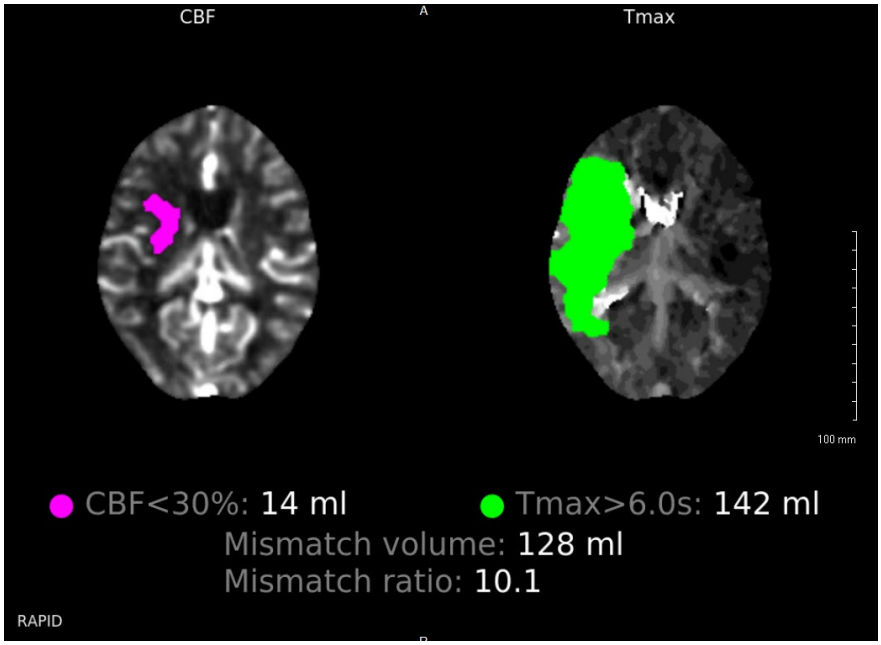
Despite initial implementation delays due to the COVID-19 pandemic, the RAPID software was installed and is operation as of June 30, 2022, in five (5) out of the six (6) hospitals, including Wahiawa General Hospital, Kona Community Hospital, Kauai Veterans Memorial Hospital, Hilo Medical Center, and Castle Medical Center. Kuakini Medical Center is awaiting RAPID server installation, which was delayed due to upgrades occurring on the hospital imaging system. QMC continues to work with Kuakini administration to expedite implementation of the project.

In FY 2022 a total of two-thousand fifty-eight (2,058) RAPID scans were successfully processed including five hundred fifty-nine (559) from Wahiawa General Hospital, eight hundred twenty-eight (828) from Hilo Medical Center, twenty-three (23) from Kauai Veterans Memorial Hospital, four hundred twelve (412) from Castle Medical Center, and two hundred thirty-six (236) from Kona Community Hospital. The use of the RAPID software resulted in the identification and provision of treatment to fourteen (14) patients eligible for MT and seventy-two (72) patients eligible for tPA or TNK. Furthermore, three hundred fifty-five (355) individuals were identified as patients who would not benefit from MT and remained in their local hospital and community instead of being unnecessarily transferred to QMC. Although a relatively small proportion of individuals are identified as eligible for MT, the impact of the RAPID software and a successful

MT procedure is life-changing, evidenced by the following case scenario.

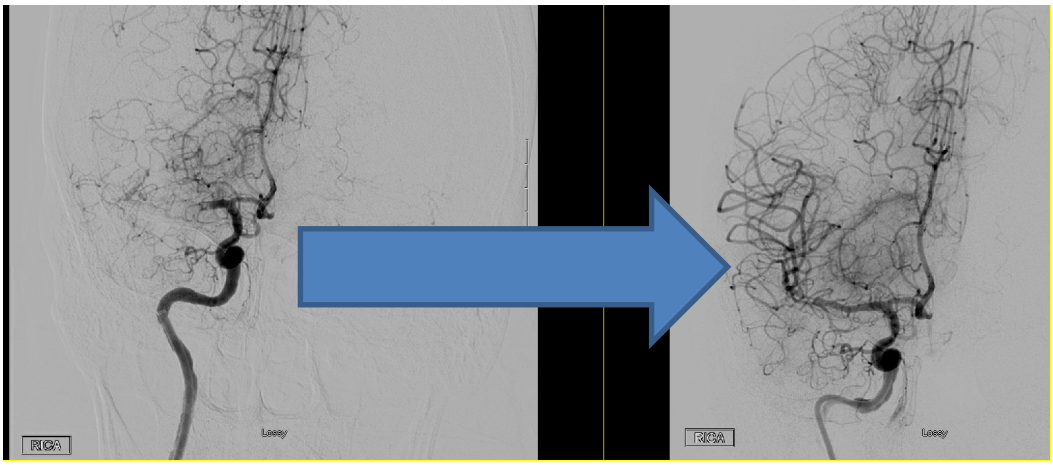
The patient presented to the medical center at 12:00 PM with left sided paralysis, slurred speech, left visual field cut, and right sided gaze deviation. Patient was last seen normal at 11:00 PM the previous night and had unwitnessed onset of stroke symptoms. Patient was seen by the Queen's neurologist using telemedicine at 12:05 PM and RAPID scans were obtained. Patient was not eligible for treatment with tPA (clot buster medication) because patient was outside the four-point five (4.5) hour time window (last seen normal thirteen (13) hours prior to presentation). The RAPID CT perfusion scan shown below demonstrates one hundred forty-two (142) mL of brain tissue that is not getting adequate blood flow (ischemia, shown in green) and fourteen (14) mL of brain tissue that is already permanently damaged (stroke, shown in purple). The mismatch volume of one hundred twenty-eight (128) mL represents the volume of brain tissue that can still be salvaged but only if the patient can have successful clot removal (mechanical thrombectomy) fast enough.

Figure 1. RAPID Scan



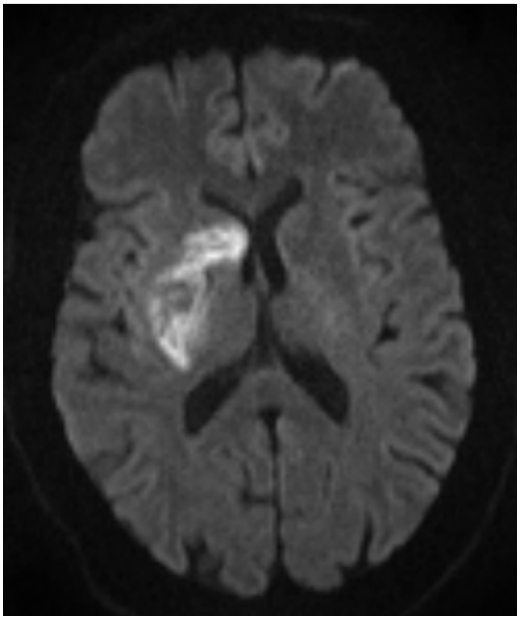
Based on the RAPID CT perfusion scan, the patient was transferred to Queen's Medical Center and arrived at 3:50 PM. Patient then underwent cerebral angiogram (shown below) which demonstrated persistent blockage of the right middle cerebral artery which was then treated using MT for successful removal of the clot that was blocking blood flow. The procedure concluded at 5:12 PM.

Figure 2. Cerebral Angiogram Showing Occlusion Pre-MT and Reperfusion Post-MT



MRI the following day (shown below) showed a stroke in the distribution that was originally predicted by the RAPID CT perfusion scan, but the remaining brain tissue was salvaged. The patient was able to start full time physical therapy in an acute rehabilitation hospital to recover from the stroke and return home.

Figure 3. Patient MRI post-MT Showing Small Stroke



This case illustrates the use of RAPID CT perfusion to expand treatment eligibility for patients with severe strokes who would not be eligible for clot buster medications. It also illustrates how RAPID can be used to triage patients for inter-island transport in order to undergo lifesaving treatments that are not available on the neighbor islands.

DOH Neurotrauma Program Information and Resource Referral

The Neurotrauma Helpline provides information and resource referrals to survivors of neurotrauma, family members, and professionals assisting survivors in identifying and obtaining access to services and supports. During FY 2022, the Neurotrauma Program provided

information and resource referral assistance seventy-eight (78) times. Thirty-five (35) contacts were initiated by survivors, nineteen (19) by professionals, sixteen (16) by caregivers, and the remaining seven (7) by a variety of callers. Traumatic brain injury was the primary diagnosis in fifty-eight (58) requests for assistance.

The majority of callers indicated a need for case management services. The desire was for one (1) source that could provide a direct link to services and supports as needed. The top requests for specific types of assistance were for medical treatment and general information on a specific neurotrauma injury, each logging twelve (12) queries. This was followed by ten (10) queries each for home/daily living assistance, interest in finding a support group and the need for suitable housing.

(3) Development of a registry within the State to identify incidence, prevalence, individual needs, and related information of survivors of neurotrauma injuries:

Section 321H-4, HRS, states the NSF shall be used for the "creation of a registry of neurotrauma injuries within the State to identify the incidence, prevalence, individual needs, and related information." Incidence of TBI, SCI, and stroke are collected via the Hawaii Trauma Registry and the Hawaii Stroke Registry, and prevalence is collected via the Behavioral Risk Factor Surveillance System. The goal of the Hawaii Neurotrauma Registry (HNTR), consistent with Goal 4 of the Neurotrauma Program Strategic Plan, is to identify the individual needs and service gaps of survivors of neurotrauma injuries after they transition back into the community from acute care and rehabilitation. The data obtained from the HNTR shall be used to make data-driven decisions to improve the system of services and supports for survivors of neurotrauma where most needed.

During FY 2022, the Neurotrauma Program worked in partnership with the Neurotrauma Data Subcommittee and community partners and stakeholders to identify methods to implement the HNTR. The HNTR is not a mandated registry and thus, the efforts focused on ensuring the data collected is a valid representation of the needs and service gaps for survivors statewide. Potential partnerships with different organizations were explored; however, no feasible options were identified that would meet the Neurotrauma Program's goals for the Registry. In FY 2021 Neurotrauma Program developed a Request for Information (RFI) to identify other potential methods for developing and implementing the HNTR in the State of Hawaii and to gain knowledge of potential vendors who may be able to provide these services. Based on responses to the RFI it was determined that Neurotrauma Program needs to consider alternative methods of data collection for the HNTR.

In FY 2023 Neurotrauma Program seeks to innovate the HNTR process by researching the use of an application that will allow neurotrauma survivors to register for HNTR and receive ongoing benefit by digitally tracking and managing their own symptoms. The application chosen will have a track record of proven success, be Health Insurance Portability and Accountability Act (HIPAA) compliant and will contain data points from the current https://health.hawaii.gov/nt/files/2020/07/Neurotrauma-Survey_DOH_Neurotrauma_Program_rev.-06-25-20.pdf . The Neurotrauma Program will seek a project manager to facilitate the recruitment process, connecting users to the application. The application will be furnished to users free of charge.

(4) Necessary administrative expenses to carry out this Section:

In FY 2022, a total of $515,100 was deposited into the funds from traffic surcharge collections. This amount is a $115,107 decrease compared to FY 2021. The total expenditure as of June 30, 2022, was $648,127. As of July 1, 2021, there was an available cash balance of $590,671. A projected FY 2023 budget for the NSF is provided in Attachment III.

The Neurotrauma Program, with input from the TBIAB, NTAB, and other community constituents plans to utilize the NSF in accordance with Section 321H-4, HRS, by supporting:

- **RAPID Hawaii: A Statewide Collaboration on Acute Stroke Care** with QMC to increase capacity to diagnose and treat stroke patients throughout the islands by implementing the RAPID software and educating providers on assessing the appropriateness of using MT for patients to prevent disabilities;

- **Project Head, Neck & Spine** by UH-KRS to continue to implement an online educational health resource that will educate school and homeschooled students in grades two (2) through twelve (12) on head, neck, and spine injuries, recognition, awareness, and prevention. The project has expanded by developing, piloting, and launching an online educational resource for educators on awareness and recognition of head, neck, and spine injuries and "Return-to-Learn" protocol to assist students with returning to the classroom;

- **Education & Dissemination of Information** by providing opportunities for education on neurotrauma to the public and providers that are in line with the Neurotrauma Program Strategic Plan objectives 1.1, 1.2, 1.3, and 2.2. Dissemination of information will be through verbal and written information (e.g., TBI, SCI and Stroke Discharge packets; conferences; events; presentations; the Neurotrauma Program Helpline; etc.) and information on the DOH Neurotrauma website. The website allows the community to access the most up-to-date information and resources on neurotrauma in real time.

ATTACHMENT I

NEUROTRAUMA ADVISORY BOARD

Section 321H-3, HRS

VOTING MEMBERSHIP	TERM REPRESENTATION
Molly Trihey	Neurotrauma Injury Survivor Spinal Cord Injury
Angie Enoka	Neurotrauma Injury Survivor Traumatic Brain Injury
Rita Manriquez	TBIAB Member Neurotrauma Injury Survivor Traumatic Brain Injury
Dr. Eugene Lee, M.D.	Private Sector Rehabilitation Hospital of the Pacific
Leilani Nutt	Trauma Center Queen's Medical Center
VACANT	Brain Injury Association of Hawaii Representative
Matthew Wells	Trauma Services Pali Momi Medical Center
Milton Takara	At-Large Neurotrauma Injury Survivor Traumatic Brain Injury
Scott Sagum	Chair Neurotrauma Injury Survivor Stroke
Stella Wong	At-Large Catholic Charities Hawaii
Valerie Yamada	At-Large Neurotrauma Injury Survivor Traumatic Brain Injury & Stroke

ATTACHMENT II

NEUROTRAUMA PROGRAM STRATEGIC PLAN

FISCAL YEARS 2021-2023

Goal 1: In coordination with community partners, expand educational opportunities to the public sector on all neurotrauma injuries to increase awareness on the effects of neurotrauma and how to respond to an injury.

Objectives:

1.1: Provide survivors and caregivers with awareness of how a neurotrauma injury can affect a person's life immediately following an injury and throughout their lifetime.

1.2: Educate the public on the signs, symptoms and what to do when recognizing a TBI, SCI or Stroke.

1.3: Coordinate public education efforts to maximize the impact and ensure efforts are not being duplicated.

Goal 2: In coordination with community partners, connect providers to educational opportunities to increase awareness of neurotrauma and improve service delivery and outcomes for the survivors they serve.

Objectives:

2.1: Provide social workers and medical providers with insight on survivors' experiences and methods for effective communication to improve collaboration between patient and provider.

2.2: Work with administration and staff involved with educating youth to establish and implement a Return-to-Learn protocol for students exhibiting signs of a TBI, including the identification of TBI signs and symptoms and how to discuss with parents.

Goal 3: Expand survivors', family members', and caregivers' connections to available resources in Hawaii.

Objectives:

3.1: Work with hospital staff and interested stakeholders to develop and implement an effective way to share information and resources with survivors to increase access to services and supports.

3.2: Provide guidance for members of the neurotrauma community to gather in a safe space to share thoughts, ideas and resources on a regular basis.

Goal 4: Use data to identify the needs and service gaps for survivors of neurotrauma and family members/caregivers.

Objectives:

4.1: Develop and implement a plan for obtaining generalizable data.

4.2: Develop and implement a plan to analyze data and identify service gaps to direct program activities.

ATTACHMENT III

PROJECTED BUDGET FOR THE NEUROTRAUMA SPECIAL FUND

FY 2023

Beginning Cash Balance as of 7/1/22	$	590,671
Encumbered Amount	$	300,000
Available Cash as of 7/1/22	$	290,671
Estimated Revenues FY 2023	$	630,000
FY 23 Estimated Expenses		
Contract Encumbrances:		
1. Website Maintenance	$	10,000
Behavioral Risk Factor Surveillance System Data	$	6,000
Get with the Guidelines Stroke Data	$	8,500
NASHIA Membership	$	1,000
Education and Awareness Activities	$	5,000
Personnel	$	304,465
Total Expenses	$	334,965
Estimated Ending Cash Balance as of 6/30/2023	$	585,706

[CHAPTER 321H]
NEUROTRAUMA

[§321H-1] Definitions. As used in this chapter, unless the context requires otherwise:

"Board" means the neurotrauma advisory board established under section 321H-3.

"Department" means department of health.

"Director" means the director of health.

"Neurotrauma" means a severe chronic disability of a person that is attributable to an injury to the central nervous system, such as traumatic brain injury and spinal cord injury, and likely to continue indefinitely. Neurotrauma can include other neurological dysfunctions but does not include substance misuse and abuse, Alzheimer's disease, or the infirmities of aging. Neurotrauma or other neurological deficits result in substantial functional limitations in two or more of the following areas:

(1) Self-care;
(2) Speech, hearing, or communication;
(3) Learning;
(4) Mobility;
(5) Self-direction;
(6) Capacity for independent living; and
(7) Economic sufficiency. [L 2002, c 160, pt of §2]

[§321H-2] Neurotrauma system. The department of health shall develop, lead, administer, coordinate, monitor, evaluate, and set direction for a comprehensive system to support and provide services for survivors of neurotrauma injuries. [L 2002, c 160, pt of §2]

§321H-3 Neurotrauma advisory board. (a) There is established within the department a neurotrauma advisory board to advise the director in implementing this chapter.

(b) The board shall consist of eleven members to be appointed by the director. The director shall designate a member to be the chairperson of the advisory board. The director or a designee shall serve as an ex officio, nonvoting member of the advisory board. The director may also appoint up to three state and county representatives whose work relates to

neurotrauma to be ex officio, nonvoting members of the board. The members shall serve for a term of four years; provided that upon the initial appointment of members, two shall be appointed for a term of one year, three for a term of two years, three for a term of three years, and three for a term of four years. In establishing the advisory board, the director shall appoint:

(1) Two survivors of neurotrauma or their family members (one for traumatic brain injuries and one for spinal cord injuries);
(2) One member of the Brain Injury Association of Hawaii;
(3) One member representing the state traumatic brain injury advisory board;
(4) Two members representing private sector businesses that provide services for neurotrauma survivors;
(5) One member representing trauma centers that provide services for neurotrauma survivors;
(6) One representative for persons with stroke; and
(7) Three at-large members.

(c) The members shall serve without compensation but shall be reimbursed for actual expenses, including travel expenses, that are necessary for the performance of their duties.

(d) The number of members necessary to constitute a quorum to do business shall consist of a majority of all the voting members who have been appointed by the director and have accepted that appointment. When a quorum is in attendance, the concurrence of a majority of the voting members in attendance shall make any action of the board valid. [L 2002, c 160, pt of §2; am L 2014, c 191, §1]

§321H-4 Neurotrauma special fund. (a) There is established the neurotrauma special fund to be administered by the department with advisory recommendations from the neurotrauma advisory board. The fund shall consist of:

(1) Moneys raised pursuant to the surcharges levied under sections 291-11.5, 291-11.6, 291C-12, 291C-12.5, 291C-12.6, 291C-102, 291C-105, and 291E-61;
(2) Federal funds granted by Congress or executive order, for the purpose of this chapter; provided that the acceptance and use of federal funds shall not commit state funds for services and shall not place an obligation upon the legislature to continue the purpose for which the federal funds are made available; and
(3) Funds appropriated by the legislature for the purpose of this chapter.

(b) The fund shall be used for the purpose of funding and contracting for services relating to neurotrauma as follows:

(1) Education on neurotrauma;
(2) Assistance to individuals and families to identify and obtain access to services;
(3) Creation of a registry of neurotrauma injuries within the State to identify incidence, prevalence, individual needs, and related information; and
(4) Necessary administrative expenses to carry out this chapter not to exceed two per cent of the total amount collected.

(c) Moneys in the neurotrauma special fund may be appropriated to obtain federal and private grant matching funds, subject to section 321H-4(a)(2).

(d) In administering the fund, the director shall maintain records of all expenditures and disbursements made from the neurotrauma special fund.

(e) The director shall submit to the legislature an annual report on the activities under the neurotrauma special fund no later than twenty days prior to the convening of each regular session. [L 2002, c 160, pt of §2; am L 2006, c 129, §6]

[§321H-5] Rules. The director may adopt rules under chapter 91 necessary to carry out this chapter. [L 2002, c 160, pt of §2]