MISSION ANALYTICS GROUP, INC.

Evaluation of Complementary and Integrative Health Services (CIHS) in the Colorado Medicaid Program: Final Report

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EXECUTIVE SUMMARY

Colorado's Medicaid program, which is administered by the Department of Health Care Policy and Financing (HCPF), is one of the few in the nation that covers Complementary and Integrative Health Services (CIHS) for individuals receiving home and community-based services (HCBS). CIHS include massage, acupuncture, and chiropractic services for individuals with a spinal cord injury in the Denver Metro area under the Spinal Cord Injury (SCI) waiver and massage services for people with intellectual or developmental disabilities under the Supported Living Services (SLS) waiver.[1]

CIHS aim to improve the wellbeing of individuals who experience mobility issues, often coupled with chronic pain, and generate cost savings for the state through reductions in other health care expenditures. Mission Analytics Group, Inc., was contracted by HCPF in 2020 to evaluate the impact of CIHS on Medicaid costs and waiver participants' health and wellbeing. Mission analyzed Medicaid claims data to assess CIHS utilization and changes in costs over time and administered a survey to CIHS users to assess perceptions of CIHS impact on quality of life.

The costs of CIHS appeared to be at least partially offset by reductions in other health care expenditures, though these findings were not statistically significant.

Mission used two difference--in--differences (DID) analyses, one for SCI waiver participants and one for SLS waiver participants, to compare the Medicaid costs for individuals with CIHS to the costs for individuals without CIHS who have similar health conditions. Costs were compared across four quarters prior to the first CIHS service (i.e., the intervention) and for 16 quarters after receipt of the first service.

Costs for the intervention and comparison groups remained relatively similar post-intervention. The analyses suggested that CIHS costs were partially offset by reductions in other health care costs, although these findings were not statistically significant.

- **SCI waiver participants:** Prior to the intervention, quarterly total Medicaid costs for the SCI intervention group were about $2,000 higher than quarterly costs for the comparison group. This difference dropped to about $1,500 after the intervention. Given that the additional average quarterly cost of CIHS for the intervention group is $700, this result suggests that CIHS costs were partially offset by reductions in other costs. However, the findings from this analysis were not statistically significant.

[1] Massage is also offered in three children's waivers: Children's Extensive Support (CES), Children's Habilitation Residential Program (CHRP), and Children with Life-Limiting Illness (CLLI) waivers.

- **SLS waiver participants:** Immediately following the intervention, costs rose for both the intervention and control groups, though more quickly for the SLS participants. After about two years, costs began to converge for the two groups, and the intervention group's total cost increase during the intervention period was lower than that of the comparison group. However, once again, these findings are not statistically significant.

Participant surveys identified pain reduction as the greatest benefit of CIHS.

Through the survey sent to all SCI Waiver participants in February 2022, respondents reported that CIHS reduced their pain, with 85% of SCI survey respondents and 74% of SLS survey respondents reporting moderate or significant improvement. SCI waiver participants often complained of discomfort from wheelchair use. One respondent indicated that because they "had to ambulate differently," they suffer from pain. CIHS is "absolutely necessary" in alleviating this discomfort. When an SLS waiver participant aged out of a children's waiver, they chose the SLS waiver to maintain the massage benefit. This decision meant they are unable to access services only available through the Developmental Disability (DD) waiver. However, the benefits of massage to their overall wellbeing made the decision worth it for them.

> *"I am very happy with our massage services. It decreases seizure activity and helps sleep. It's better than any other therapy. Recently the therapist couldn't come in for 2 weeks [due to minor injury] and the change is noticeable. The seizures are back, they are having trouble sleeping, so massage has definitely had a huge positive impact." – Caregiver of SLS waiver participant*

Survey responses also pointed to improved mental health, with about two thirds of survey respondents reporting that CIHS moderately or significantly improved anxiety, depression, and/or negative feelings. Respondents reported being able to sleep better and engage in more meaningful activities due to these physical and mental health benefits.

Participants reported that overall access to CIHS was good, although there were some barriers.

While survey respondents and interviewees reported relatively few challenges, some faced CIHS access issues. A handful of respondents reported delays enrolling in the SCI waiver due to complex diagnoses or lack of case manager guidance. Most SLS and SCI waiver participants do not drive themselves and instead rely on Medicaid or public transportation to access CIHS, which can be unreliable and inconvenient. The COVID-19 pandemic also created access barriers, with several respondents reporting that they were unsure of how to schedule CIHS appointments once they were ready to return to in-person treatment.

Finally, survey respondents reported that there are not enough providers to serve this population, likely due to lower Medicaid reimbursement rates than in private settings and provider employment disruptions due to COVID-19.

The July 2022 expansion of CIHS will offer new opportunities.

In 2022, the Colorado Senate Bill 21-038 expanded the SCI waiver by making it statewide and extending eligibility to people with additional conditions that affect independent ambulation. Qualifying individuals are able to access services under the expanded waiver, renamed the Complementary Integrative Health (CIH) waiver, starting in July 2022.

This expansion offers new opportunities and challenges. More individuals will experience the benefits of CIHS. However, lack of providers and transportation barriers, especially in rural areas, may hinder access. Recruiting and compensating CIHS and transportation providers will be key activities for HCPF in the summer of 2022. In addition, case managers will play a crucial role in educating newly eligible individuals about the new waiver. Case managers must be trained not only on the enrollment process, but on the tradeoffs between the CIH waiver and their existing waiver, the available service providers in the area, and strategies for accessing services.

The expansion may also bolster the evaluation. The analysis has relatively small samples of individuals in the intervention groups, meaning the treatment effect would need to be large to achieve statistically significant results. As more people access CIHS over time, Mission can examine larger samples and improve the reliability of estimated effects. Mission also plans to conduct a survey of newly eligible individuals to gather baseline data on interest in CIHS and quality of life to analyze over time.

INTRODUCTION

Colorado's Medicaid program is one of the few in the nation that covers Complementary and Integrative Health Services (CIHS) for individuals receiving home and community--based services (HCBS). These services have been provided through two waivers: the Spinal Cord Injury (SCI) waiver and the Supported Living Services (SLS) waiver.

The SCI waiver, administered by the Department of Health Care Policy and Financing (HCPF), was approved by the state legislature in 2009 and implemented in 2012 to provide massage, acupuncture, and chiropractic services to individuals with a spinal cord injury in the Denver Metro area who were enrolled in the Elderly, Blind, and Disabled (EBD) waiver. Individuals with more recent injuries enroll directly in the SCI waiver to receive CIHS. In 2022, the Colorado Senate Bill 21-038 expanded the waiver by making it available statewide and by expanding eligibility to individuals with additional conditions that affect independent ambulation. Qualifying individuals can access services under the expanded waiver, renamed the Complementary Integrative Health (CIH) waiver, effective July 2022. CIHS (massage services only) are also offered through the SLS waiver, [2] intellectual or development.[3]

Table 1: Snapshot of Adult Waivers that Offer CIHS

	SCI Waiver	SLS Waiver
Population	*Prior to July 2022*: Individuals with a spinal cord injury with significant functional impairment *After July 2022 expansion*: People with conditions that affect independent ambulation	Individuals with intellectual or developmental disabilities that meet Intermediate Care Facility level of care requirements
Service reach	*Prior to July 2022*: Denver Metro Area *After July 2022 expansion*: Statewide	Statewide
CIHS offered	Massage, acupuncture, and chiropractic services	Massage

While CIHS are promoted by advocates to improve the wellbeing of individuals who experience mobility issues that are often combined with chronic pain, they are also intended to provide financial benefits to the state. The state aims to see reductions in other

[3] Massage is also offered in three children's waivers: Children's Extensive Support (CES) waiver, Children's Habilitation Residential Program (CHRP) waiver, and Children with Life-Limiting Illness (CLLI) waiver.

health care expenditures by improving participant health and thus reducing a participant's need for other health-related interventions.

Mission Analytics Group, Inc., was contracted by HCPF in 2020 to design and conduct an evaluation of CIHS that considers cost savings and impact on participants' health and wellbeing. The evaluation design builds off a previous evaluation implemented by the National Research Center, Inc., with input from members of the SCI Advisory Committee and Dr. Patricia Herman of the RAND Corporation.

The evaluation answers the following research questions:

1. What are the patterns of CIHS use among SCI and SLS waiver participants?
2. Are CIHS associated with lower health care costs?
3. Are CIHS related to better quality of life scores?
4. How do participants perceive the benefits of CIHS?
5. What challenges do participants face in accessing CIHS?

Mission released its first report in June 2021, covering surveys and interviews conducted in the spring of 2021 and findings from Medicaid claims data through September 2020. This report updates findings with surveys conducted in the spring of 2022 and Medicaid claims data through December 2021. Future reports will include utilization and outcomes related to individuals newly eligible under the waiver expansion in July 2022.

Section 1 of the report presents the evaluation methodology, including a description of its two data sources: Medicaid administrative data and survey data. Section 2 reports the findings by research question. The report concludes with considerations for HCPF related to waiver enrollment and reducing barriers to care to support CIHS access in the future.

1. METHODOLOGY

The evaluation answers the research questions through two main data sources: Medicaid administrative data and survey data (Table 2). These sources and related analytical methods are described below.

Table 2: Research Question by Data Source

Research Question	Medicaid Data	Surveys
What are the patterns of CIHS use?	✔	
Are CIHS associated with lower health care costs?	✔	
Are CIHS related to better quality of life scores?	✔	✔
How do participants perceive the benefits of CIHS?		✔
What challenges do participants face in accessing CIHS?		✔

A. Medicaid and Assessment Administrative Data

Mission uses a difference -in -differences (DID) method that compares cost outcomes for an intervention group and a comparison group before and after starting CIHS to evaluate the impact of CIHS on Medicaid costs.

Data Sources

The DID method relies on Medicaid claims data and assessment data, which include information from waiver intake forms that are completed upon waiver enrollment and service levels assigned to those in the SLS waiver. The Medicaid claims data span from July 2012 through December 2021 and consist of quarterly costs by service category for SCI, EBD, and SLS waiver participants. The assessment data include diagnoses, SLS service levels, gender, and birth year for these individuals.

Creation of Intervention and Comparison Groups

Mission created an intervention group and a comparison group for the SCI and SLS waivers. The intervention groups for the SCI and SLS waivers consist of individuals with CIHS usage in their Medicaid claims. Individuals in the comparison group are matched to individuals in the intervention group based on:

- *Health condition*: For the SCI comparison group, we matched EBD waiver participants on SCI diagnoses or diagnoses for quadriplegia or paraplegia on the intake forms. For the SLS comparison group, we matched SLS waiver participants without massage services on the service level.
- *Dual eligibility status (both Medicare and Medicaid)*: Since Medicare pays for some health care services for people dually enrolled in Medicare and Medicaid, matching on insurance status ensures cost comparability.

- *Existence of inpatient claims in the quarter prior to the intervention*: Inpatient claims explain much of the variability of costs. Therefore, we matched on the presence of these types of claims in quarters prior to the intervention, which helps ensure that pre-intervention trends are similar for both the intervention and comparison groups.
- *CIHS start dates*: Because CIHS start dates for the intervention group range over several years, we assign each comparison individual the same intervention period as the intervention individual that they are matched to. Thus, each matched intervention and comparison grouping are subject to the same time -varying effects.

The intervention and comparison groups are also restricted to individuals with four sequential quarters of claims data to establish a pre-intervention trend and 16 sequential quarters following the first intervention quarter to establish a post-intervention trend.

Mission identified 46 individuals in the SCI waiver intervention group and matched them to 80 EBD waiver participants with similar characteristics. Mission identified 41 individuals in the SLS waiver intervention group who accessed massage services and matched them with 82 other SLS waiver participants who did not access massage services.

Outcomes

For the intervention and comparison groups, Mission compared Medicaid costs overall and Medicaid costs for each of the following categories: waiver services, primary care, pharmacy, outpatient, inpatient, emergency department, emergency medical services, skilled home health, and nursing facility.

Analysis

The DID method enables comparison of pre- and post-intervention outcomes for the treatment and comparison groups to identify an average treatment effect on the treated (ATET). By comparing outcomes across groups and over time, the model eliminates time-invariant effects between the two groups and time-varying unobservable effects experienced by both groups. It cannot account for unobserved effects that occurred in the comparison group during the intervention; however, the fact that the four -quarter intervention period varies by individual should mitigate any potential bias in this regard. The ATET captures changes experienced by the intervention group unrelated to trends prior to the intervention and factors that influence both groups during the intervention period.

B. Surveys

SCI waiver participants and SLS waiver participants who received massage services completed surveys in March and April 2021 to provide information on their health and wellbeing and their perceptions of service impact.

Content

The survey (Appendix A) has four main sections:

1. *Background*: This section captures characteristics that may impact participants' health, wellbeing, and use of CIHS, including injury or diagnosis, access to transportation, and social supports.
2. *Quality of Life*: The EQ-5D-5L,[4] an internationally validated survey, was used to assess quality of life. This survey has five domains: pain, anxiety, self-care, usual activities, and mobility, with participants indicating severity by choosing from a range of five options ranked from least to most severe.
3. *Perceptions of Impact of CIHS*: Individuals who received CIHS reported how they believed CIHS impacted their pain, energy levels, negative feelings (e.g., anxiety and depression), ability to work or volunteer, and health care utilization.
4. *Satisfaction with CIHS*: The final section of the survey allowed participants to report information on how they learned about the SCI waiver, the ease of enrolling in the SCI waiver, and barriers to obtaining services and attending appointments. The SLS waiver has a much longer history than the SCI waiver, so questions on waiver enrollment were not included in the SLS survey.

Each respondent was assigned an identifier that could be linked back to Medicaid administrative data.

Respondents

Individuals completed the survey online, on paper, or over the phone. Of the 217 individuals enrolled in the SCI waiver, 81 completed the survey (31%). Of the 217 individuals in the SLS waiver who received massage services in 2021, 105 completed the survey (48%). About half of the SCI waiver survey respondents had injuries that resulted in quadriplegia, a third had injuries resulting in paraplegia, and the remaining share had other conditions that affected their mobility. Seventy-five percent of SCI respondents and 87 percent of SLS respondents indicated that their support systems (emotional, logistical, and financial) were strong or very strong.

Survey respondents were reasonably comparable to SCI waiver participants and SLS waiver participants who use massage overall. As presented in Table 3, SCI respondents and

[4] EQ-5D, https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/

non-respondents had similar patterns of CIHS utilization and overall Medicaid costs. However, SCI waiver respondents had higher costs than non-respondents for CIHS, but lower overall Medicaid costs. SLS waiver respondents had lower average massage costs as well as overall Medicaid costs. These general similarities indicate that the survey responses are representative of the overall population.

Table 3: Quarterly Medicaid Costs: Comparison of Survey Respondents to Non-Respondents, 2012–2021, in 2022 Dollars

	Average Quarterly CIHS Costs	Average Quarterly Total Medicaid Costs
SCI Waiver Participants		
Respondents (N = 81)	$548	$17,102
Non-Respondents (N = 136)	$393	$18,744
SLS Waiver Participants		
Respondents (N = 105)	$552	$12,833
Non-Respondents (N = 114)	$655	$16,000

Analysis

Mission used survey findings to present information on perceptions of service benefits and issues with service access. In addition, a cross-sectional analysis assessed whether differences in quality of life outcomes are associated with CIHS use. This cross-sectional analysis examined other factors that may influence health and wellbeing that were identified in the survey and Medicaid administrative data, such as Medicaid service level for SLS waiver participants and level of social supports and result of injury for SCI waiver participants. The Medicaid service level is identified through Medicaid administrative data, while level of social supports and type of injury for SCI waiver participants are identified from the survey data.

2. FINDINGS

CIHS users reported that CIHS reduces pain, increases mobility, and improves mental health. An analysis of costs in Medicaid claims indicated that CIHS costs were partially offset by reductions in other health care expenditures, but these findings were not statistically significant. These findings are discussed in more detail in the sections below.

A. What Are the Patterns of CIHS Use?

Of the 256 individuals who enrolled in the SCI waiver from 2012 to 2021, roughly two -thirds (176) used Medicaid -funded CIHS. All but two CIHS users within the SCI waiver accessed massage services (Table 4). The second most common service was acupuncture, with 152 users. Just under half of those enrolled in the SCI waiver accessed chiropractic services. A total of 502 individuals in the SLS waiver accessed massage services between 2012 and 2021. On average, SCI waiver participants utilized $632 of CIHS per quarter, compared to $477 for SLS waiver participants.

Table 4: Quarterly CIHS Utilization and Costs, 2012–2021, in 2022 Dollars

Service	Participants with Any Service	Avg. Quarterly Units	Quarterly Costs		
			Mean	Median	Std. Deviation
All CIHS for SCI Waiver Participants	176	37	$632	$595	$414
Massage	174	21	$302	$296	$189
Acupuncture	152	14	$269	$217	$217
Chiropractic	131	6	$135	$84	$130
Massage for SLS Waiver Participants	502	24	$477	$318	$536

For individuals in the SCI intervention group, CIHS utilization was fairly consistent or declined slightly in the two years following their first quarter accessing services, with average quarterly costs of about $700 (Figure 1). Massage and acupuncture services each accounted for about 40% of CIHS costs, at about $300 per quarter for each, and chiropractic costs were about $100 per quarter for this group. For the SLS intervention group, there was a gradual decline in the use of massage services. The average quarterly cost for massage services was about $650 for the first year, dropped to about $500 in the subsequent eight quarters, and rose to about $600 for the next four quarters (Figure 2). These trends can be explored in future evaluations.

Figure 1: Quarterly CIHS Costs for SCI Intervention Group, in 2022 Dollars

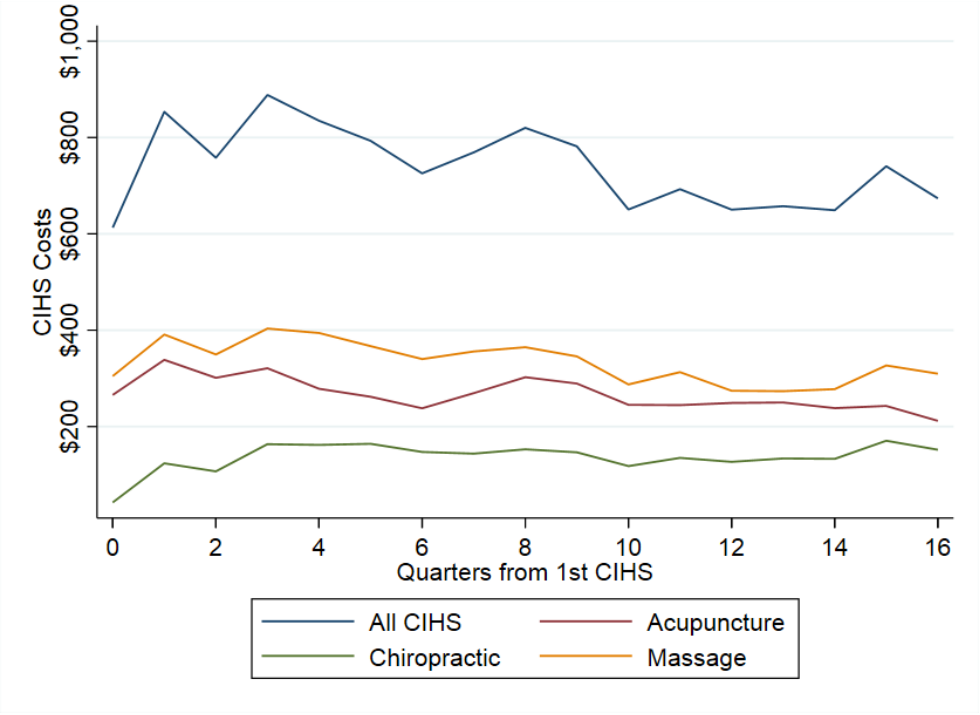
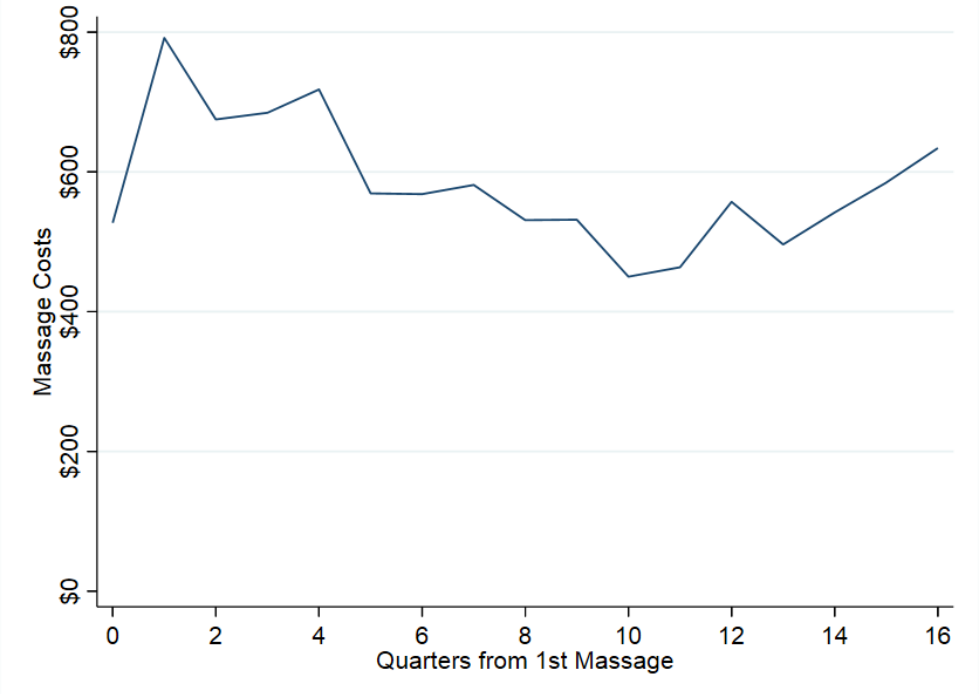


Figure 2: Quarterly Massage Costs for SLS Intervention Group, in 2022 Dollars



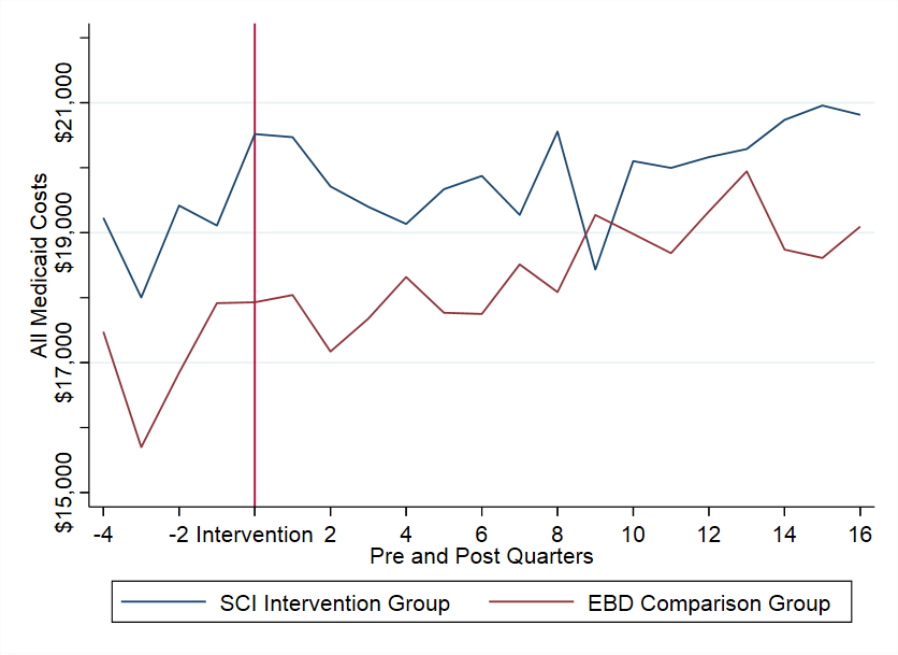
B. Are CIHS Associated with Lower Health Care Costs?

Post-intervention costs for both intervention and comparison groups were relatively similar. However, there is suggestive evidence, primarily for the SCI intervention group, that the costs of CIHS were partially offset by reductions in other health care costs, although these findings were not statistically significant.

SCI Waiver Participants

Prior to the intervention (i.e., first CIHS service), total Medicaid quarterly costs were rising over time for both the intervention and comparison groups. Costs remained largely constant for the intervention group following the intervention, but continued to rise for the comparison group (Figure 3).[5] Costs were about $2,000 higher per quarter for the SCI intervention group prior to the intervention, but the difference dropped to about $1,500 after the intervention, with the intervention group showing average quarterly Medicaid costs of $19,974 and the comparison group showing $18,499. Given that the additional average quarterly cost of CIHS for the intervention group is $700, this figure suggests that CIHS were partially offset by reductions in other costs.

Figure 3: Average Quarterly Medicaid Costs for the SCI Intervention Group and EBD Comparison Group



[5] DID methods require parallel trends in the pre-intervention period between the intervention and comparison groups, which is clearly shown in Figure 3.

Except for waiver costs, costs decreased in all categories for both the SCI intervention and SCI comparison groups (Table 5). The biggest drop in costs was observed in outpatient services, showing an average quarterly cost decrease of $1,611 ($5,210 to $3,599). Skilled home health costs decreased by over $1,000 and inpatient services costs decreased by $566. The comparison group showed decreases in the same categories, although they were smaller than the decreases for the SCI intervention group.

Table 5: Average Pre- and Post -Intervention Quarterly Costs by Cost Category for the SCI Intervention Group and Comparison Group

Costs	Intervention Group		Comparison Group	
	Pre-Intervention Costs	Post-Intervention Costs	Pre-Intervention Costs	Post-Intervention Costs
All Medicaid	$18,940	$19,974	$16,984	$18,499
Waiver	$10,218	$14,060	$11,066	$13,737
Primary Care	$81	$63	$41	$43
Pharmacy	$274	$251	$339	$227
Outpatient	$5,210	$3,599	$3,718	$3,023
Inpatient	$650	$84	$353	$160
Emergency Department	$48	$29	$20	$7
Emergency Medical Services	$167	$107	$107	$66
Skilled Home Health	$3,704	$2,530	$2,893	$2,246

Table 6 presents the estimated treatment effects for each of the Medicaid cost categories. The effects are in dollars, and a negative treatment effect means that either the increase in costs was lower for the intervention group (as is the case for all Medicaid costs) or that costs decreased more for the intervention group (as with skilled home health). Positive effects mean that costs increased more or that costs decreased less for the intervention group (as with pharmacy costs). The analysis found an estimated negative treatment effect for most of the Medicaid cost categories; however, it did not find a statistically significant effect in any category, as the 95% confidence interval ranges from negative to positive for each effect. For overall Medicaid costs, the estimated impact suggests that costs rise less by -$342 for the intervention group, but the 95% interval shows that the effect could fall between -$2,157 and $1,478.

Table 6: Treatment Effect for Each Cost Category, SCI Waiver

Costs	Treatment Effect	95% Confidence Interval
All Medicaid	-$342	[-$2,157 to $1,478]
Waiver Services*	--	--
Primary Care	-$16	[-$37 to $3]
Pharmacy	$100	[-$64 to $264]
Outpatient	-$813	[-$2,249 to $822]
Inpatient	-$400	[-$1,115 to $314]
Emergency Department	-$4	[-$36 to $29]
Emergency Medical Services	-$20	[-$91 to $50]
Skilled Home Health	-$469	[-$1,831 to $893]

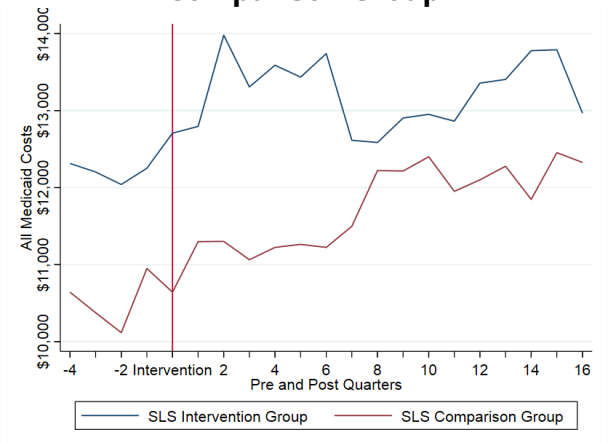
** For waiver services, the model indicated a positive effect (i.e., an increase in costs for the intervention group relative to the comparison group), but the parallel trend assumption is violated for this cost category, with costs declining for the SCI intervention group in the pre-intervention period and costs increasing in the pre-intervention period for the comparison group.*

The lack of statistical significance for any of the cost categories prevents definitive statements about the impact of CIHS on Medicaid costs. However, the pattern of estimated effects suggests that CIHS costs may have been partially offset by declines in other costs, or at least, were not associated with cost increases.

SLS Waiver Participants

For the SLS waiver participants, the intervention and comparison groups show parallel trends and relatively flat costs in the pre-intervention period, with the average quarterly costs of the intervention group $2,000 above the comparison group (Figure 4). Following the intervention, costs appeared to rise more quickly for the intervention group. However, after about two years, costs began to converge for the two groups.

Figure 4: Average Quarterly Medicaid Costs for the SLS Intervention Group and Comparison Group



Costs increased for all Medicaid cost categories for both groups (Table 7). On average, the increases are higher for the comparison group than the intervention group. Overall, costs increased by $1,051 for the intervention group (from $12,203 to $13,254) compared to an increase of $1,270 for the comparison group (from $10,522 to $11,792). The biggest difference in the increase in costs between the two groups occurred in pharmacy costs, with the comparison group showing a $503 increase (from $1,140 to $1,643), compared to only a $115 increase for the intervention group (from $577 to $692). The largest cost increase for both groups occurred in waiver services. Although the cost increase for the intervention group was above the average costs associated with massage services, the overall cost increase was lower than in the comparison group.

Table 7: Average Pre- and Post -Intervention Quarterly Costs by Cost Category for the SLS Intervention Group and Comparison Group

Costs	Intervention Group		Comparison Group	
	Pre-Intervention Costs	Post-Intervention Costs	Pre-Intervention Costs	Post-Intervention Costs
All Medicaid	$12,203	$13,254	$10,522	$11,792
Waiver	$3,588	$4,603	$4,103	$4,762
Primary Care	$43	$57	$42	$52
Pharmacy	$577	$692	$1,140	$1,643
Outpatient	$6,600	$6,762	$4,225	$4,571
Inpatient	$0	$100	$0	$51
Emergency Department	$10	$10	$15	$14
Emergency Medical Services	$52	$78	$63	$69
Skilled Home Health	$4,497	$4,815	$4,024	$4,457

The estimated impact was mixed across the different cost categories, with about half showing an estimated positive impact on costs and the other half showing a negative impact on costs. However, the estimate for overall costs is -$183, meaning cost increases for the intervention group are $183 lower compared to the cost increase for the comparison group (Table 8). The lack of statistical significance for other service types precludes definitive statements about cost decreases or increases in other categories.

Table 8: Treatment Effect for Each Cost Category, SLS Waiver

Costs	Treatment Effect	95% Confidence Interval
All Medicaid	-$183	[-$1,323 to $956]
Waiver Services	$346	[-$74 to $767]
Primary Care	$5	[-$18 to $27]
Pharmacy	-$370	[-$1,000 to $259]
Outpatient	-$182	[-$827 to $463]
Inpatient	$46	[-$91 to $183]
Emergency Department	$2	[-$15 to $19]
Emergency Medical Services	$21	[-$5 to $46]
Skilled Home Health	-$104	[-$678 to $469]

Limitations and Next Steps for the Evaluation

Although the Medicaid claims DID analysis suggests the additional costs associated with CIHS were partially offset by reductions in other health care costs, the lack of statistical significance for nearly all the estimated effects means the analysis cannot conclusively determine whether Medicaid costs increased or declined in the waiver intervention groups compared to the comparison groups.

A challenge with the current analysis is the relatively small number of individuals in the intervention groups; analyses on smaller sample sizes typically require larger treatment effects to achieve sufficient power to establish statistical significance. As more individuals access CIHS over time, the evaluation can study larger samples and improve the reliability of estimated effects.

Mission also experienced challenges in creating reliable comparison groups. First, about 20% of SCI waiver participants lacked SCI diagnoses or outcomes on their intake forms. In addition, the onset date of injury was almost always missing. The evaluation attempted to use SCI diagnoses on inpatient claims as an onset indicator, but this proved unreliable. Instead, Mission found that matching on the presence of inpatient claims in the pre-intervention quarters improved the comparability of pre-intervention trends between the intervention and comparison groups. However, this requirement led to a few intervention participants not being matched and limited the pool of potential matched participants in the comparison groups.

C. Are CIHS Associated with Better Quality of Life Scores?

Individuals who used CIHS within the SCI waiver tended to report through the survey higher quality of life scores than SCI waiver participants who did not use CIHS. Of CIHS users in the SCI waiver, 88% had moderate to good quality of life scores, compared to 73%

of non-users (Figure 5). However, there were more non-users with good quality of life scores (18% compared to 7% of users). When controlling for type of injury and social supports, there was no statistically significant relationship between CIHS usage and quality of life score overall.

The 2021 survey showed a clearer relationship between quality of life score and CIHS usage than the 2022 survey (Figure 6). Thirty-one percent of CIHS users in the 2021 survey had good quality of life scores compared to 7% of CIHS users in the 2022 survey. The 2022 survey had fewer respondents who do not use CIHS (22 compared to 35), possibly affecting results. These individuals may have stopped using CIHS early in the COVID-19 pandemic and restarted under the 2022 survey.

Figure 5: Quality of Life for SCI Waiver Participants by CIHS Use, 2022 Survey

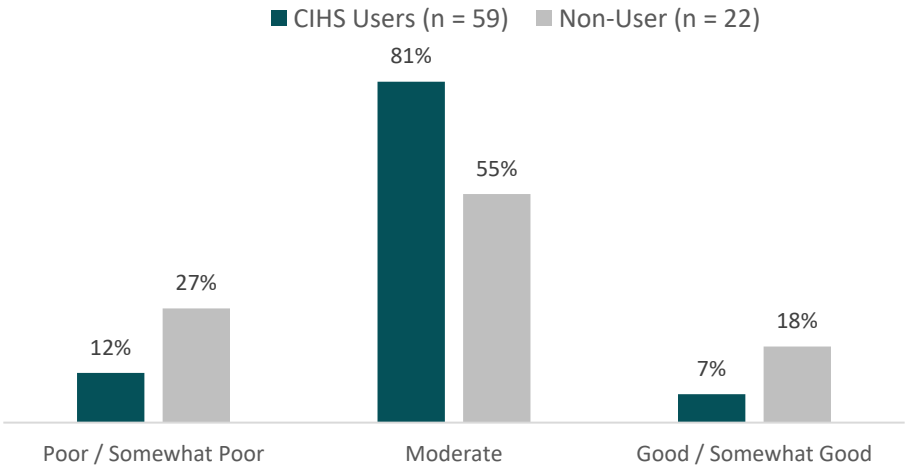
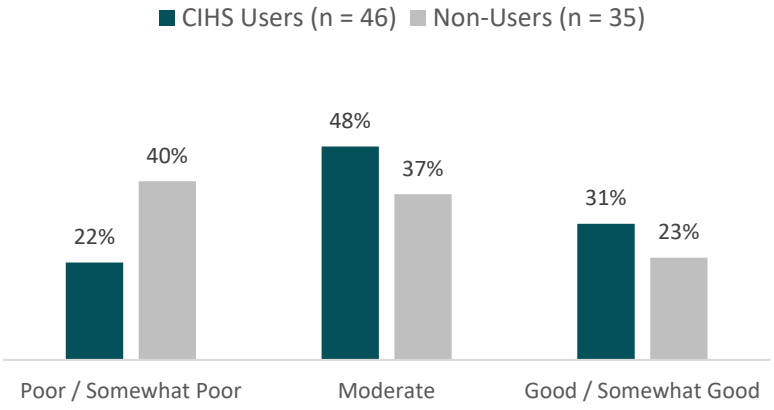


Figure 6: Quality of Life for SCI Waiver Participants by CIHS Use, 2021 Survey



For SLS waiver participants, quality of life scores were similar for CIHS users and non-users. The cross-sectional analysis that controls for service use indicated that there was no statistical difference in quality of life scores between CIHS users and non-users.

D. How Do Participants Perceive the Benefits of CIHS?

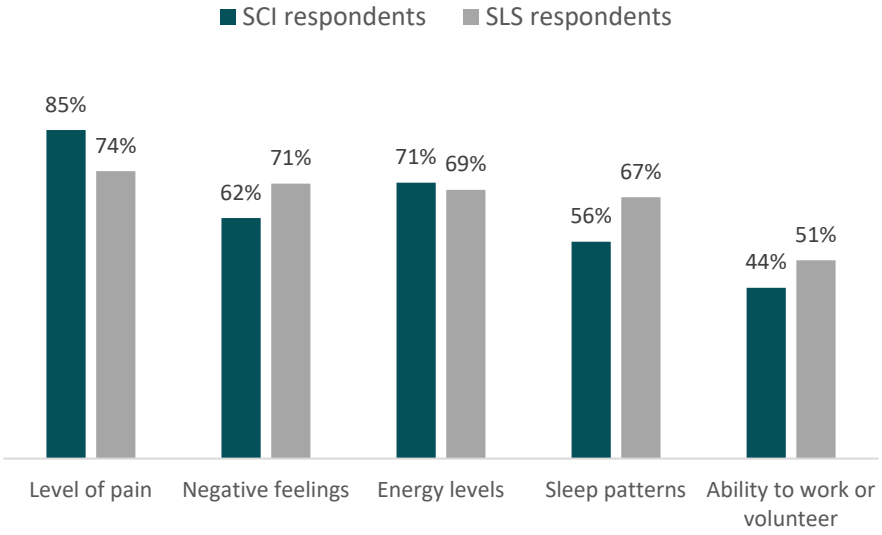
Survey respondents reported that CIHS' greatest benefit is reducing pain, with 85% of SCI survey respondents and 74% of SLS survey respondents reporting significant or moderate improvement in pain levels (Figure 7). SCI waiver participants often complained of the muscle tension associated with wheelchair use. One respondent indicated that because they "have to ambulate differently," they suffer from pain. CIHS is "absolutely necessary" in alleviating their discomfort.

> *"My very first acupuncture appointment dispelled a level of nervous energy, and the massage had vastly improved pain. These interventions are absolutely necessary for those of us who are forced to ambulate differently." – SCI waiver participant*

> *"I love going to massage. It helps my body and if I get the massage, I don't feel pain anymore." – SLS waiver participant*

> *"It really helps with pain. I might get stiff and sore after a good day at work, but my body heals better and sleeps better at night when I get my weekly massage." – SLS waiver participant*

Figure 7: Percentage of Survey Respondents Who Reported that CIHS Significantly or Moderately Improved Aspects of Wellbeing



Respondents also indicated that CIHS relaxes muscles and improves mobility. They reported benefits such as fewer spasms, better sensation, more relaxed breathing, and muscle tension relief after seizure events.

When an SLS waiver participant aged out of the children's waiver, she chose the SLS waiver to maintain the massage benefit. This decision was difficult because she would no longer have access to some services only available through the DD waiver. However, the benefits of massage to her overall wellbeing make the decision worth it for her and her family.

Surveys also pointed to improved mental health, with about two thirds of survey respondents reporting that CIHS significantly or moderately improved anxiety, depression, and/or negative feelings. An SCI waiver participant reported that "weekly massage therapy resulted in a noticeable improvement in mood and lessening anxiety and startle reflex." Multiple respondents also commented on the strong relationships they have with their therapists; they feel "listened to," valued, and respected.

Respondents could often sleep better and engage in more meaningful activities due to these physical and mental health benefits. One SLS waiver participant reported being more active in sports because of massage; it relieves his pain, increases his energy levels, and heightens sensation. An SLS waiver participant reported that the massage "helps with sleep" due to relaxed muscles and tendons.

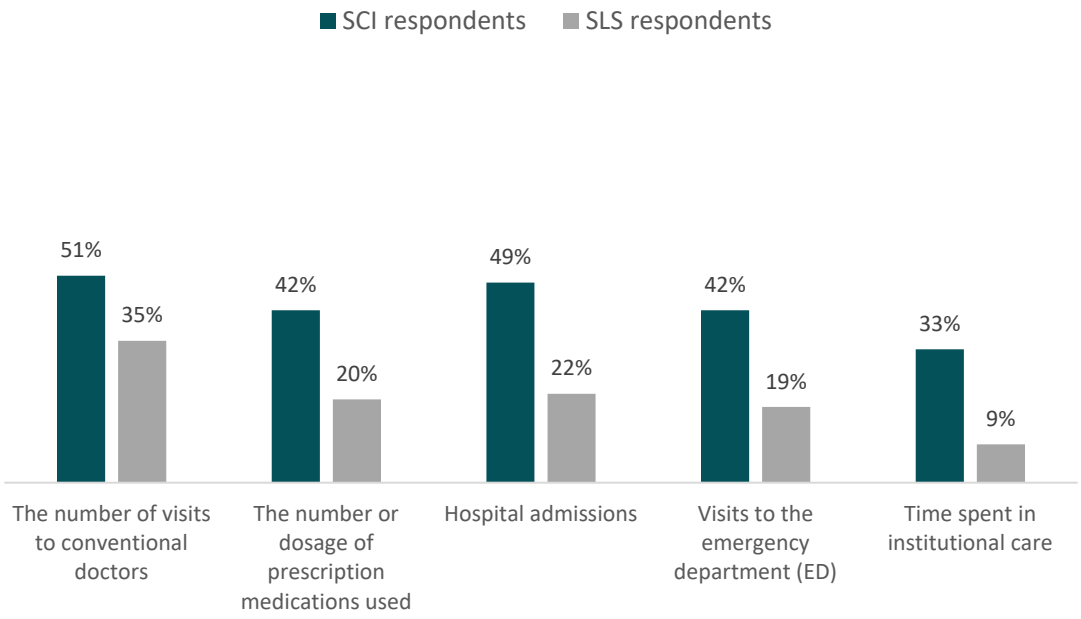
> *"Massage therapy has helped me to learn to relax and listen to my body; I have chronic back pain which affects my mood and sleep, and massage has helped with that too." – SLS waiver participant*

One SLS waiver recipient reported an increase in medication use because of massage. Massage increased her commitment to improving her mental health. She started seeing a psychiatrist, thus increasing her medication intake, which is part of her mental health recovery.

Respondents reported that CIHS had less impact on health care utilization. Fewer than half of SCI waiver respondents and even fewer SLS respondents reported a moderate or significant reduction in doctors' visits, medications used, emergency department visits, and hospital admissions because of CIHS (Figure 8). However, one SCI waiver participant reported a "decrease in PRN [taken as needed] medications" due to CIHS. An SLS waiver participant indicated that "I feel much better and have fewer visits for injections, physical therapy, etc." A caregiver of an SLS waiver participant reported that massage helps the member avoid injury by addressing issues with physical sensation. CIHS had the least reported impact on institutional care and

hospital admissions, with many reporting that they do not require these services, regardless of CIHS.

Figure 8: Percentage of Survey Respondents Who Reported that CIHS Moderately or Significantly Reduced Health Care Utilization



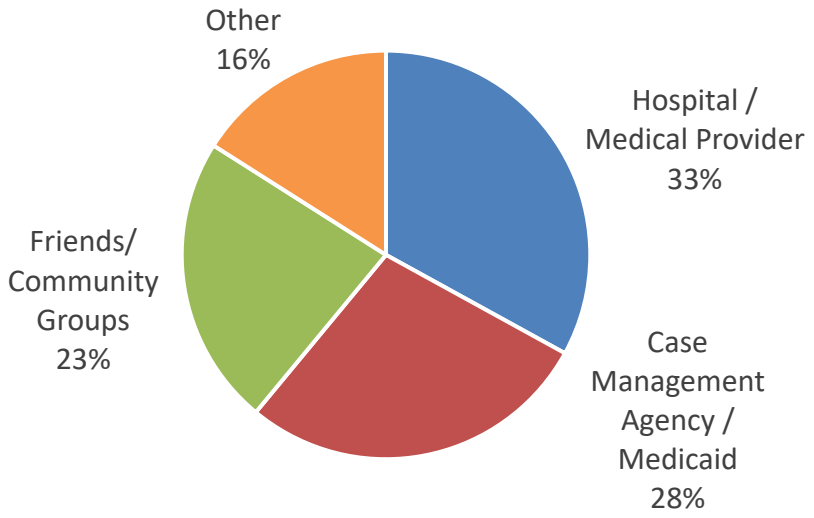
E. Do Participants Face Challenges in Accessing CIHS?

While survey respondents generally reported relatively few challenges when enrolling in the SCI waiver, some participants faced barriers to accessing the services, especially related to transportation, COVID-19 and other health issues, and appointment availability. For some participants, these barriers became unavoidable, and the participants stopped using CIHS.

Enrollment in the SCI Waiver

Individuals must first enroll in the SCI waiver to access CIHS. Survey respondents learned about the waiver from various sources. A third of respondents learned about it through the hospitals or medical providers that initially treated them for their injuries. Many respondents also learned about the waiver from their case management agencies upon enrollment in Medicaid or from friends or community groups that serve people with spinal cord injuries. Five respondents shared that they learned about the waiver from a specific provider, while three respondents indicated that they had learned about it via the Internet or social media.

Figure 9: How Survey Respondents Learned of the SCI Waiver (Percentage of Total Responses)



Most respondents (71%) shared that enrolling in the SCI waiver was either straightforward or "fine with a few bumps." However, more than a quarter ran into challenges enrolling in the waiver. These individuals may have conditions that do not clearly point to eligibility, such as neurological conditions that affect mobility.

> *"When [you] apply for the SCI waiver program I wish there was a better description or diagram chart of the steps needed to take to apply and who would be able to help along the way with those steps." – New SCI waiver participant*

Service Access

Almost half of the respondents that use CIHS reported that they rarely miss appointments. However, transportation, health issues, and COVID-19 were reported as frequent barriers to CIHS access. Only one SCI waiver participant reported that the benefits of CIHS were not worth the effort to overcome these barriers.

- ***Transportation*** was the most prevalent barrier among respondents, with about 30% of the respondents indicating transportation as a reason they might miss appointments. More than half of SCI respondents rely on other people driving them, whether it be friends or family, paratransit ride services, public transit, or taxi or ride sharing. Since CIHS providers may not be close by, transportation is a key barrier for service access.
- ***Health issues*** were also common reasons for respondents to miss CIHS appointments, affecting about a quarter of respondents. Many SCI and SLS waiver participants have complex medical conditions and may not be able to make appointments when health issues come up. Two participants shared that they

would find "in-home" CIHS visits a beneficial option, especially for participants who are bedridden.

- ***COVID-19*** remains a barrier for individuals to access CIHS, including individual or family member COVID-19 infection, individual COVID-19 precautions, or CIHS providers being closed or offering limited availability. Concerns with COVID-19 seemed to amplify other issues, causing participants to travel farther for CIHS and resulting in unexpected appointment cancellations for some.
- ***Appointment availability*** can be restrictive for participants, especially those balancing multiple schedules and obligations. About 16% of participants noted that appointment availability contributed to them missing appointments. Several participants also noted that there did not seem to be enough CIHS providers available to easily access services near where they lived, while others experienced cancellations due to limited provider capacity.

"Weekly massage therapy resulted in a noticeable improvement in mood and lessening anxiety and startle reflex. We wish there were many more massage therapists available/accessible with the SLS waiver." – SLS waiver participant

"I've experienced more cancellations and last minute cancellations in the past 6-8 months… Weather and COVID did impact some of missed appointments - but not all. Last minute cancellations are the hardest, as I plan my schedule, caregivers, and eating around my massage." – SCI waiver participant

- ***Work or volunteering*** schedules may also restrict when a participant is able to receive services, especially if CIHS providers are only open during typical work hours. About 14% of SCI waiver participants shared that they missed some appointments for work or volunteering reasons.

Why Some Participants Have Stopped CIHS Use Altogether

Under the SLS and SCI waivers, 14% and 15% of respondents, respectively, stopped using massage services. For acupuncture and chiropractic services under the SCI waiver, 25% and 33% of respondents stopped using services. Their reasons for ending their services varied, generally overlapping with the barriers to access listed in the previous section.

Lack of appointment or provider availability was the most common reason for both SCI and SLS users to stop CIHS. Some SCI waiver participants reported being unwilling or unable to look for new providers after their initial providers stopped providing CIHS for COVID-19 or other reasons. A few SCI waiver participants stopped using services because they met the limit in the number of visits set by Medicaid, although they wished they could continue. A few SLS waiver participants had been using massage services, but when they moved to the

DD waiver, they were no longer eligible for the services unless they paid out-of-pocket. One SLS waiver participant had been using massage services in his hometown, but when he went away for school, he only used services when visiting home every few months because his family could not find a provider in his new location.

Several participants stopped using services due to time constraints. For one SLS waiver participant, the lack of availability and schedule constraints made it impossible to continue massage services:

> *"Availability of massage therapist was very limited and I could not fit it in my schedule any longer." – SLS waiver participant*

While a handful of respondents found that the services were not beneficial enough to continue, overall, the main reasons to stop were barriers to accessing the services, especially if appointments were unavailable, too far away or inaccessible for participants relying on others for transportation, and/or conflicting with participants' or drivers' schedules.

3. Conclusions and Recommendations

Waiver participants reported that CIHS improve their pain and other aspects of their health and wellbeing. While the evaluation did not find a statistically significant impact of CIHS on health care costs, the observed patterns of costs over time between the intervention and comparison groups suggest that the costs of CIHS were partially offset by reductions in other health care expenditures.

The July 2022 launch of the expanded CIH waiver will provide an important opportunity to expand the benefits of CIHS. However, this increase in access comes with multiple hurdles. To facilitate the launch, HCPF can consider:

Enhancing Provider Capacity

Thousands of individuals will become newly eligible for CIHS, necessitating the enrollment of more CIHS providers in the Medicaid program. Recruitment will be a challenge given lower Medicaid reimbursement for CIHS services compared to private payers or self-pay customers. While rural areas will likely face the greatest shortage of providers, the Denver Metro area should become a focal point of recruitment to meet demand.

HCPF can work with licensing boards and educational institutions to identify all CIHS providers in the state and disseminate information about the waiver. Personalized outreach and support with the application process can encourage provider enrollment. HCPF can also work with providers to identify strategies for dealing with large demand, such as caps on referrals.

HCPF should also engage the existing CIHS providers within the SCI and SLS waivers to conduct intensive trainings so new providers are equipped to treat individuals with severe mobility issues due to injury and other medical conditions. Some providers may be interested in joining the CIH waiver but lack confidence in working with these populations.

HCPF will likely need to address Medicaid transportation and paratransit benefits to help individuals access services, especially if they are far from their residence.

Utilizing Case Manager as a Crucial Source of Information and Enrollment Support

Case managers who are familiar with the CIH waiver and service providers are crucial in helping consumers navigate the enrollment process and prevent mistakes that can delay the start of services. They can also inform participants of available service providers and strategies for accessing services.

A massive training effort needs to make all existing and new case managers aware of the benefit, CIH waiver enrollment procedures, and local service availability. They should also

be prepared to help individuals understand tradeoffs in benefits, especially if they have to leave their existing waiver for the CIH waiver.

Promoting Consumer Awareness of the New Benefit

SCI waiver members surveyed for this evaluation reported that the hospital that treated them after their injuries was a key source of information on waiver services. Given the new eligibility criteria, HCPF should develop new outreach efforts, including direct mailings, emails, and texts to individuals as well as personal contacts by case managers. HCPF can also consider informing other Medicaid HCBS providers about the benefit so they can assist their clients. The CIHS evaluation will capture these changes over time and report updated findings related to access under the expansion.

APPENDIX A: SURVEY FOR SCI WAIVER PARTICIPANTS

Thank you for taking this survey on your experience with Complementary and Integrative Health Services (CIHS), offered through the Spinal Cord Injury (SCI) waiver. The Department of Health Care Policy and Financing (HCPF), the agency that operates the state Medicaid program, would like to better understand how these services might impact your health and wellbeing and your suggestions to improve services and the functioning of the waiver. Your data will be processed and analyzed using the highest security standards. The evaluation team will only share data in the aggregate. Quotes may be included in public reports but will not be attributed to individuals.

Background

1. Type or result of your spinal cord injury
   - ○ Quadriplegia
   - ○ Paraplegia
   - ○ Other: _____
2. How would you describe your support network (types could include emotional, financial, or logistical support)?
   - ○ Very strong
   - ○ Strong
   - ○ Moderate
   - ○ Minimal

3. Primary source of transportation
    - ○ Drive myself
    - ○ Taxi / ride sharing
    - ○ Public bus
    - ○ Paratransit ride service
    - ○ Others drive
    - ○ Other: _____

Quality of Life (EQ-5D-5L)

The below questions will help HCPF understand if CIHS affects qualify of life over time. They make up an internationally validated survey called the EQ-5D-5L. You can watch a 2-minute video on the survey to learn more about how it was developed and is used today: https://euroqol.org/. To maintain validity (i.e., the degree to which the survey measures what it claims to measure), questions cannot be dropped or changed. We understand that the final question on mobility might not seem applicable to individuals in wheelchairs. Please check the box that you consider is the best option for you, i.e., the option that most accurately represents your opinion about your current situation with respect to mobility.

2. Pain
    - ○ I have no pain or discomfort
    - ○ I have slight pain or discomfort
    - ○ I have moderate pain or discomfort
    - ○ I have severe pain or discomfort
    - ○ I have extreme pain or discomfort
3. Anxiety
    - ○ I am not anxious or depressed
    - ○ I am slightly anxious or depressed
    - ○ I am moderately anxious or depressed
    - ○ I am severely anxious or depressed
    - ○ I am extremely anxious or depressed
4. Self-Care
    - ○ I have no problems washing or dressing myself
    - ○ I have slight problems washing or dressing myself
    - ○ I have moderate problems washing or dressing myself
    - ○ I have severe problems washing or dressing myself
    - ○ I am unable to wash or dress myself
5. Usual Activities

- ○ I have no problems with performing my usual activities
- ○ I have slight problems with performing my usual activities
- ○ I have moderate problems with performing my usual activities
- ○ I have severe problems with performing my usual activities
- ○ I am unable to perform my usual activities

6. Mobility: *Individuals in wheelchairs can check the box that you consider is the best option for you. In other words, check the option that most accurately represents your opinion about your current situation with respect to mobility, replacing "walking about" to "getting around" if applicable."*
   - ○ I have no problems walking about
   - ○ I have slight problems walking about
   - ○ I have moderate problems walking about
   - ○ I have severe problems walking about
   - ○ I am unable to walk about

Perception of Impact of CIHS

HCPF would also like to know how you think that CIHS has affected your pain levels, your ability to take care of yourself both emotionally and physically, and your use of health care services.

7. How would you describe your use of CIHS? Please check the appropriate box for each service.

	Massage	Acupuncture	Chiropractic Services
Active user	○	○	○
Moderate user	○	○	○
Previously used services, but stopped	○	○	○
Have not used services but plan to	○	○	○
Have not used services and don't plan to	○	○	○

8. If you have <u>not</u> ever used massage, acupuncture, or chiropractic services, why not? If you have stopped using any of these services, why?

9. **If you have <u>ever</u> used massage, acupuncture, or chiropractic services**, to what extent do you feel that they impact (impacted) the following aspects of your health and wellbeing?

	Significant improvement	Moderate improvement	Minimal improvement	No change	Worsened
Level of pain	○	○	○	○	○
Negative feelings, such as blue mood, despair, anxiety, depression, or no motivation	○	○	○	○	○
Ability to work or volunteer	○	○	○	○	○
Energy levels	○	○	○	○	○
Sleep patterns	○	○	○	○	○

10. **If you have <u>ever</u> used massage, acupuncture, or chiropractic services**, to what extent do you feel that they impact (impacted) the following?

	5 (decreased a lot)	4	3 (no change)	2	1 (increased a lot)
The number of visits to conventional doctors (e.g., primary care physicians)	○	○	○	○	○

The number or dosage of prescription medications used	○	○	○	○	○
Hospital admissions	○	○	○	○	○
Visits to the emergency department (ED)	○	○	○	○	○
Time spent in institutional care (e.g., rehab facility, skilled nursing facility)	○	○	○	○	○

Satisfaction with SCI Waiver

HCPF would like to understand what barriers you might face in accessing services and suggestions for improvement.

11. How did you hear about the SCI waiver?
    - ○ Hospital
    - ○ Another medical provider
    - ○ Case management agency
    - ○ Friends / community group
    - ○ Internet / social media
    - ○ Other: _____

12. How would you describe the ease of joining the SCI waiver?
    - ○ Straightforward
    - ○ A few bumps, but overall fine
    - ○ Challenging
    - ○ Extremely challenging
    - ○ Other (please add description below):

13. What are your top reasons for missing (or not scheduling) CIHS appointments? (*check up to three reasons*)
    - ○ I rarely miss appointments
    - ○ Transportation
    - ○ Appointment availability
    - ○ Work/volunteer schedule
    - ○ Health issues
    - ○ COVID-19
    - ○ Service benefits are not worth the effort
    - ○ Other: _____

14. General Comments on Satisfaction and Suggestions for Improvement

15. Would you be willing to participate in a 30-45 minute interview to discuss your experience with CIHS?

- ○ Yes
- ○ No