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Colorado Behavioral  
Healthcare Council

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**Program Title: Acuity Matrix**

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**Organization: SummitStone Health Partners**

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***Program Abstract (50 words max, please):***

SummitStone developed an Acuity Matrix that measures a clients acuity level through objective data analysis. The Acuity Matrix allows SummitStone to prepare for resource distribution and planning, provides detail about the client population being served by payor source, measures client acuity over time and aids in understanding if the client is getting better or worse over time. The Acuity Matrix has allowed SummitStone to develop case rate estimates for serving clients at different acuity levels. SummitStone's Acuity Matrix demonstrates the most comprehensive look at acuity based on behavioral health data points, as compared to most other acuity tools which are based on primary care metrics.

***Program Description (Include program development, program information, staffing requirements, pertinent data, and start-up costs.): \*Please limit to 2 pages, and remember to address all criteria specified.***

**Program Name: Acuity Matrix**

**Program Description:**

In FY20-21, SummitStone Health Partners FBI – Financial Business Intelligence and Data Analytics Department undertook an initiative to objectively evaluate client acuity levels. The mandate dealt with providing SummitStone Health Partners with an ability to categorize clients on a numerical scale of 1 through 5, with 5 reflecting the most acute case, to aid in more efficient resource allocation, identify average amount of direct clinical care time needed to serve clients with similar acuity levels, and an average cost associated with treatment for each level of acuity. SummitStone can now measure how much direct client care time is available to serve clients by employee (FTE), the average amount of direct client care hours needed to serve clients based on acuity level, and the client acuity makeup by payor source (i.e., Medicaid, Medicare, Self-Pay, etc.). The Acuity Matrix has positioned SummitStone to maximize the efficiency of its most valuable resource deployment (employee's time) and tailor services, caseloads, and financial resources to serve the community more effectively. SummitStone's ability to target specific client populations with more resources where most needed will improve client outcomes.

**Approach:**

The FBI team understood the shortcomings of any “financially” driven model that would attempt to represent the acuity of individual clients, groups of clients, or by program association (i.e., Out-Patient, CSU, Forensics, etc.). Following a clinical driven approach to the acuity matrix allowed the FBI team to reduce bias, misunderstanding, and noise that is generally associated with bad modeling techniques. Stakeholders that participated in creating the acuity matrix model included the Chief Medical Officer, Chief Addiction Officer, Chief Clinical Officer, Director of Out-Patient Services, Director of Acute Services, and clinicians.

We took an approach to have the acuity matrix committee inform the FBI department on “Factors of Influence” that stakeholders recognize as an indicator of high acuity levels for a client. For example, PHQ-9 scores directly assess a client's risk level, holds (involuntary and voluntary) specifically identify cases of more acute clients, and receiving CRISIS services at the CSU is a good indicator of a more acute client. After a couple of meetings to discuss, reflect on, and evaluate different variables that had a high degree of potential to correlate with higher

levels of acuity we settled on 32 “Factors of Influence”. The factors of influence spanned from diagnosis, medications, hospitalizations, IOP, gender identity, to age and quantity/type of services.

At this point the FBI team had some very valuable information and some homework to do. The list of 32 Factors included variables that were known to have high correlation with acuity. We approached the 32 Factors by first targeting the high correlation variables and then looking at data availability, integrity, frequency, and reportability. We strove to develop a model that was fully replicable, verifiable, and adjustable over time. We ultimately landed on 13 dimensions of influence for the Acuity Matrix. All 13 dimensions are highly correlated with acuity and are directly captured in AVATAR (our EMR system). The 13 dimensions are reported with enough frequency to be statistically measured.

### **The Acuity Matrix:**

The Acuity Matrix is comprised of the following 13 dimensions:

1. Diagnosis
2. Services
3. Medications
4. PHQ-9 scores
5. Zero Suicide Pathway
6. Holds (Involuntary and Voluntary), Emergency Commitments/Admissions (SUD), Hospitalizations (Emergency Outcomes)
7. Age (Young and Old)
8. CRISIS Intervention Services
9. Law Enforcement Involvement (Co-Responders)
10. IOP (Intensive Out-Patient Services)
11. DACOD (Drug Alcohol Coordinated Data Systems)
12. CCAR (Crisis Contract Status Report)
13. CSSRS (related to Zero Suicide Pathway but different)

Each dimension has an associated calculation for determining the value (1 through 5) given to each client. For instance, the Chief Medical Officer and Chief Addiction Officer were able to identify specific diagnosis that they ranked as 5 to reflect the most severe cases. PHQ-9 scores have a predetermined scale for severity and the Acuity Matrix included this scale directly into the modeling to minimize calculation noise error where possible. The Acuity Matrix uses a predetermined scale for severity whenever possible as this reduces error (i.e., PHQ-9, CCAR, CSSRS) and statistical noise.

Upon the completion of the ranking scales for each 13 dimension it was discovered through Linear Regression Analysis that certain variables explained more of the variance from the mean than others and correlation does exist between some of the independent variables. Thus, a secondary measurement was introduced to the overall ranking of the 13 dimension that were included. More weight is attributed to the following dimensions: CRISIS Intervention Services, Law Enforcement Involvement (Co-Responder), Holds. While less weight was given to dimensions such as DACOD and CCAR. The basis for different weights for the 13 dimensions is that some of the dimensions are more directly correlated with higher acuity seen when serving a client. For instance, holds (Voluntary and Involuntary) correlated more strongly to acuity than only knowing the age of a client.

### **Results:**

SummitStone FY19-20:

- Unduplicated Clients Served: 9,287
- High Acuity Clients (those with acuity Levels 3, 4, and 5) = 5,390
- Low Acuity Clients (those with acuity Levels 1 and 2) = 3,897
- High Acuity Clients make up of total population = 58%
- Total Services attributed to High Acuity Clients = 89.70%
- Total Client Direct Service Hours to High Acuity Clients = 90.10%
- Cost Per Population Served (Based on FY19-20 Unit Cost):
  - Acuity Level 5 = \$7,293
  - Acuity Level 4 = \$3,940
  - Acuity Level 3 = \$1,985
  - Acuity Level 2 = \$ 920
  - Acuity Level 1 = \$ 486
- RVU Production by Population Served (Based on FY19-20 Unit Cost):
  - Acuity Level 5 = 129,988 or 49%
  - Acuity Level 4 = 78,780 or 30%
  - Acuity Level 3 = 34,764 or 13%
  - Acuity Level 2 = 12,161 or 5%
  - Acuity Level 1 = 8,489 or 3%
- Acuity/Complexity Level by Payor Source (Average):
  - Medicaid Region 1 = 3.69
  - Medicaid Non-Region 1 = 3.65
  - Medicare = 3.85
  - Medicaid FFS = 3.83
  - Third Party/Commercial = 2.94

### **Result Summary:**

SummitStone has gained the ability to identify the acuity level by Client, Payor Source, Team, and Provider. We continue to mine this data to gain insights for capacity planning, strategic targeting of vulnerable populations, more precise forecasting of current and future needs, and more efficient deployment of current and future resources to meet the objectives of our strategic plan and provide the most tailored services to clients in our community.

### **Review of Acuity Matrix Model:**

Upon completion of the Acuity Matrix model the FBI team worked with Clinical Directors and Managers to evaluate the model for relevancy. We provided a list of random clients that fell into each level of the acuity matrix. We asked for feedback from clinicians working in the field to help assess how they would rank the clients and compared them to the model's ranking. Overwhelmingly, the feedback was in line with expectations. We found no feedback in the severity of a case where a client was ranked a level 5 and a clinician reported that they should be a level 2 or 1 (this was also true in the reverse order).

### **Closing Summary:**

The Acuity Matrix developed at SummitStone by the FBI team is a clinician driven model that lends itself to objective data. The model is completely replicable across CMHC's, and data is derived from the AVATAR EMR system. The Acuity Matrix is designed to have an annual version upgrade that will further evaluate the 13 current dimensions for additional scope, will bring together clinical teams across SummitStone to gain more understanding of acuity and possibly add to the dimensions already included, allow for deep dives into case load management, and focus on providing resources to those providers, teams, and clients that need it the most.

- The Acuity Matrix allows us to measure a client’s acuity across time which gives us an ability to measure if the client is getting better or worse over the treatment period being reviewed.
- The Acuity Matrix is designed to be a collaborative approach that can be shared across CMHC’s to get universal agreement on included dimensions and standardize acuity levels and descriptions.
- Our current RAE is deploying a Risk Adjustment Tool to describe the population being served by CMHC’s.
  - The Acuity Matrix can be compared to this Risk Adjustment Tool for validation and negotiation.
- As funding received by CMHC’s moves toward “Outcome Based Payment” or “Risk Adjusted Payment” the Acuity Matrix is well positioned to provide insight, data, and evaluations that can be used to gain deeper understandings of the impact of switching to new funding models.
- SummitStone’s Acuity Matrix demonstrates the most comprehensive look at acuity based on behavioral health data points, as compared to most other acuity tools which are based on primary care metrics.