Neighborhood Health Plan
Identification of Children with Special Health Care Needs
Summary of "Utilization" Indicator

The Utilization module of the algorithm to identify Children with Special Health Care Needs (CSHCN) is a set of programs that uses utilization as its criteria. Utilization is considered to be any type of service or treatment known to the health plan through the receipt of claims data. At NHP, this includes, but is not limited to, office visits, durable medical equipment, prescriptions, specialty services, and medical supplies. The logic of the algorithm assumes that extreme rates of usage of any particular service could be symptomatic of a known or unknown health care need.

Because the algorithm is entirely based on administrative data (without direct contact with the member or medical record) it interprets any qualifying criteria as suggestive of a health care need, as opposed to *confirmation* of a health care need. The term "Indicator" is used to reflect this supposition. Therefore, children identified by the algorithm as meeting the qualifying criteria would likely be subject to further evaluation. A plan may choose to send an assessment survey to families identified by the algorithm in order to gather more information.

Execution of the Utilization Indicator at Neighborhood Health Plan uses a three-step approach:

1. Creation of a temporary CSHCN group
2. Using the temporary CSHCN group to build a real-time set of services assumed to be reflective of special health care needs
3. Using the created set of services to seek out unidentified children with special needs.

The services used in the Utilization Indicator are real-time, so there is no firm list of services used from one algorithm run to the next. Each run is time-dependent, intended to be sensitive to changes in provider practice, inclusive of new services, and flexible with changes in treatments such as prescription drugs. All the above are represented by claim codes (procedure codes, revenue codes, HCPCS, and therapeutic class codes) which would require ongoing research or review for updates if packaged in fixed list. Organizations do not necessarily house the resources for such ongoing maintenance, and the lack thereof would make any established utilization criteria out of date within a matter of months.

The Utilization Indicator is intended to be the last set of criteria applied when multiple indicators are used to identify CSHCN. The number of indicators used in the identification process will vary according to each organization's available data. For example, if only FACCT diagnoses are available, the diagnoses are collected first and utilization data second; If FACCT diagnoses and cost data are available, the utilization data is collected third.

Step 1: Creation of a temporary CSHCN group

A prerequisite for use of the utilization indicator is the creation of an interim group of members identified as CSHCN using available criteria, such as the FACCT diagnoses. The interim CSHCN group is referred to as the "Pilot CSHCN" group. Many of the members identified for the Pilot CSHCN group will be later included in the final "true" set of CSHCN group once the algorithm has been completed. The purpose of the Pilot CSHCN is to determine the data that will supply the algorithm with a set of utilization codes by which other children (not yet diagnosed) can be identified.

During the development of the Pilot CSHCN group, a member-level tally is kept to record the extent to which a member qualified for inclusion in the pilot group by indicator. For example, a member may be considered a CSHCN by the presence of a claim with a FACCT diagnosis. A different child, however, may be more likely to be a CSHCN if *five* FACCT diagnoses are documented. A tracking sheet records the number of qualifying diagnoses that were found for each member. The diagnoses have to pass logic checking for duplicate episodes as well as come from completely different diagnostic categories as defined by FACCT. For example, a child with a claim containing a diagnosis of "017" (Tuberculosis) and another claim of "030" (Leprosy) is considered to have only one qualifying diagnosis of "Infectious Disease". The child is considered to have multiple conditions only if their recorded diagnoses cross multiple categories, such as Infectious Disease, Diabetes, and Psychoses. Some children at NHP have qualifying diagnoses from as many as seven distinct diagnostic categories.

To incorporate the varying degrees of health conditions into the algorithm, a numeric level of (1 or 2) or (1, 2, or 3) is assigned to each member for each indicator. The higher level number reflects a higher state of health need. For the diagnosis indicator, a child with one FACCT diagnosis is assigned a level of 1; a child with two FACCT diagnoses is assigned a level of 2; and three or more is assigned a level of 3. Within the Cost Indicator, members having incurred expenses that are within the top 95th percent of total pediatric costs to the plan during a twelve month period are assigned a level 1; Those in the 99th percent of costs are assigned a 2. This approach of assigning need levels for each member is used for each indicator.

After completion of the initial indicators, a tally of the levels is computed for each member. At NHP, there are five sets of criteria processed prior to the run of the Utilization Indicator:

1. FACCT diagnoses
2. Search for disability rating category
3. High-cost members
4. Lengthy hospital stays
5. Involvement with external agencies

Members having a tally of "1" (met only one set of criteria at a low level) are considered to be potential CSHCN, but with less certainty. Those with a tally of "2" (met the criteria for two separate indicators, or a high level within one indicator) are considered moderate CSHCN. Members with a tally of "3" or more are those who appear to have demonstrated having multiple health care needs and comprise the Pilot CSHCN group for use in the Utilization Indicator. It is this set of members, within the stated time frame, that informs the Utilization Indicator module of the services to use to seek out any CSHCN who have not yet been identified by the previously processed sets of criteria.

Step 2: Using the temporary CSHCN group to build a real-time set of services assumed to be reflective of special health care needs

Two sets of pediatric members are formed for further processing: The Pilot CSHCN group and a randomly-sampled group of "Typicals" (pediatric members who have not yet met any criteria to qualify as a CSHCN). A method of sampling is used to produce a sample of Typicals large enough to meet industry standard levels of error and confidence. The group of Typicals serves as the algorithm's control group.

All claims incurred within the study period for the Pilot group are collected. Data sources include medical, behavioral health (mental health and chemical dependency), and pharmacy claims. A scrubbing routine weeds out duplicate services and formats pharmaceutical AHS therapeutic class codes to be processed as "procedure" codes.

Rates of utilization (per thousand member years) are computed for each service (defined at the procedure code level) by incorporating the number of member months (represented by partial-month units) each Pilot member was enrolled with the plan. The same procedures are then gathered for the members in the Typical group for the same time period with rates of utilization computed as described above for each service in the Typical group. A rate difference between the two groups is calculated for each procedure by dividing the rates for the Pilot group by the rates for the Typical group.

The following description of a "weighting" feature is incorporated into the algorithm, but not yet operational. The weights are intended to be applied to the rate differences of each procedure in the following way: The Utilization Indicator saves all procedures from past algorithm runs to be back-referenced during a current run. A routine checks in storage to see whether a current service has been found, based on its increased utilization in the Pilot CSHCN subset, to be indicative of a special need in a previous run. A record is kept of the number of times a service is found per number of algorithm runs. This computation is an absolute value between 0 and 1. A value closer to 1 (or equal to 1) indicates a strongly performing procedure (ie: occurs frequently over time). Values closer to 0 are weaker performing procedures. Weight values equal to or less than 0 will eliminate a procedure from further processing in the current algorithm.

The intent of this feature is to recognize services or treatments that may be only temporarily associated with CSHCN, and therefore not necessarily appropriate for identification of an ongoing issue in the long term. Examples of this case may be an experimental drug that has been introduced, but which has not yet shown a history of effectiveness. Likewise, a treatment used in the past may be altered (reflected by an updated CPT code) or replaced entirely by an alternative procedure. A higher weight will be computed for a service that the algorithm recognizes frequently over time, indicating a more likely association with the support of a special health care need.

After the calculation of weights, a threshold involving the frequency of procedures and difference in utilization rates between the Pilot and Typical groups are used to begin to target a select group of procedures more highly associated with the Pilot group [of kids with special health care needs] than with the Typical group [of kids with typical health care needs]. Many rounds of testing and examination of the utilization rates between the groups yielded the following threshold:

Isolate the procedures that have a minimum computed utilization rate difference of 9.00. In addition, keep a procedure if the rate difference is 0.00, but there were at least 5 occurrences of the procedure found by the Pilot group. This step isolates services found to have occurred

nine times (or more) often among the group symptomatic of special health care needs. In some cases, there are procedures that appeared to be related to specific diagnoses found in the FACCT list of diagnoses identifying CSHCN, but which were found in both the Pilot and Typical groups, such as colonoscopies and cystometrograms. It is perhaps that some procedures more typically used for the maintenance of a special need are also used for baselines or ruling out such conditions among typically healthy children. For this reason, there are few procedures strongly correlated with children with special health care needs that can be considered exclusive to this group. For those few procedures that were found to be exclusive to the Pilot group, there must be a minimum count of 5 during the study period in order to weed out aberrations.

The next step omits procedures with a significantly higher utilization rate by the Pilot group, yet were still found to be common with the Typical group. These procedures are eliminated because while they may be used at an extreme rate by the Pilot group, they are common enough among those in the Typical group to be considered universal to all. Among the procedures isolated in the step above, exclude any from further processing where the rate of utilization by the Typical group is greater than or equal to 15.00 and the difference in rate from the Pilot group is less than 100.00. In addition, exclude procedures with weights less than or equal to 0.00. Below is a partial list of twenty procedures that met this criteria at NHP. The full set of procedures found having met the above criteria are those that will be used to "throw out the net" to search among the plan's remaining typically-healthy group for any child not yet identified as having a special health care need.

CSHCN - Procedures Used for Utilization Indicator
Sorted by Rate/1000 MY for Pilot CSHCN
Highest Rate to Lowest Rate - Top 20

Procedure Code	Number of Occurs	Description of Procedure	Util.Rate: Pilot	Util.Rate: Typicals	Difference in Rates
X2314	3143	EIP Homevisit,max.2hr,per15min	3500.68	18.85	185.71
EI290	1938	HOME VISIT	2158.55	12.82	168.37
551	1437	SKILLED NURS/VISIT	1600.53	5.03	318.20
281604	1270	ANTIDEPRESSANTS	1414.53	14.46	97.82
281292	1222	MISCELLANEOUS ANTICONVULSANTS	1361.07	4.99	272.76
90862	1012	CHEMO-MEDICATION EVAL - 15 MIN	1127.17	13.77	81.86
99232	966	HOSPITAL VISIT, SUBSEQUENT, 2	1075.93	3.72	289.23
X2316	874	EIP child foc grp, 15 min unit	973.46	6.05	160.90
281608	785	ANTIPSYCHOTIC AGENTS	874.33	2.83	308.95
240800	774	HYPOTENSIVE AGENTS	862.08	13.02	66.21
305	764	LAB/HEMATOLOGY	850.94	8.41	101.18
301	732	LAB/CHEMISTRY	815.30	6.99	116.64
99233	677	HOSPITAL VISIT, SUBSEQUENT, 3	754.04	1.32	571.24
99231	635	HOSPITAL VISIT, SUBSEQUENT, 1	707.26	1.31	539.89
X5619	507	COMMUNITY SUPPORT TEAM - CHILD	564.70	0.07	8067.14
90801	487	PSYCH DIAGNOSTIC SERV (EXISTIN	542.42	12.03	45.09
320	452	DX X-RAY	503.44	7.24	69.54
270	432	MED-SUR SUPPLIES	481.16	12.10	39.77
X2315	393	EIP ctrbased indiv visit 15 min	437.72	1.54	284.23
82565	365	CREATININE;	406.54	4.16	97.73

Step 3: Using the created set of services to seek out unidentified children with special needs

The full set of procedure codes reflecting services that met the threshold criteria described above are stored in a data mart within the NHP data warehouse. A program searches the data warehouse for any pediatric claims that include any of the procedures stored for the study period. A procedural unit is considered to be no more than one procedure per member per day.

Members' involvement in the development of the Utilization Indicator was for the identification of eligible *services* only - not for eligible *members*. Therefore at this point, all pediatric members can participate in the search, including those who were used as members in the Pilot CSHCN or Typical groups. This is to allow such members the opportunity to be tested as eligible for the criteria developed for the Utilization Indicator. As stated earlier, a tracking system records the number of Indicators for which each member qualifies.

Member-month totals are gathered for any member found having a qualifying service during the study period. Utilization rates by procedure code are computed for each member using services per thousand member year units and each member's rate(s) are then compared with the associated procedure rate(s) that were calculated for the Pilot CSHCN group. In order to meet the criteria of the Utilization Indicator, a member must show utilization rates above and beyond those computed for the Pilot group.

The criteria is:

- Enrollment during the study period.
- Each unique procedure considered includes at least 2 dates of service per member.
- Each member's rates of utilization per procedure must be higher than the equivalent procedural rate computed for the Pilot CSHCN group.
- A member must have minimum of 3 separate sets of qualifying services during the study period.

Degree levels are assigned to each member according to the number of times a qualifying procedure was found:
Level 1: 3 procedures found = "Low level of utilization"
Level 2: 4-5 procedures found = "Medium level of utilization"
Level 3: 6 or more procedures found = "High level of utilization"
The level numbers (1, 2, or 3) are stored in the members' indicator tracking record.

Determining the Final Set of CSHCN

A tally of the level values across indicators is computed for each member in the tracking sheet. As stated previously, the tally incorporates the number of indicators met, as well as the extent to which criteria was found within each indicator (Low, High; or Low, Medium, High).

Using the tally, members are categorized into final CSHCN "Tiers" - also having values of Low, Medium, and High. Members in the Low Tier are those with a sum tally of 1; the Medium Tier are the members having a sum tally of 2; the High Tier are those with a sum tally of 3 or more and are considered the most likely CSHCN at NHP. Prior to the run of the Utilization Indicator, members had temporary tier assignments according to their sum tallies, as described above. Of those in the Medium Tier, some may later meet the criteria of the Utilization Indicator and move to the High Tier by having a sum tally of at least 3. Among those in NHP's last algorithm run, 22% of the High Tier CSHCN had moved from the Medium to High Tier by their criteria met in the Utilization Indicator.