USER’S GUIDE

Children’s Health Survey
For Asthma (CHSA)

This manual provides information about the development, administration, and scoring for:

Children’s Health Survey for Asthma (Parent Version)
Children’s Health Survey for Asthma-C (Child Version)

American Academy of Pediatrics
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WHAT IS THE CHILD HEALTH MEASUREMENT PROJECT?

The Child Health Measurement Project (CHMP) is part of the American Academy of Pediatrics’ Department of Research. Our goals are to enhance and advance health services research related to children and their families. Some of our past and current projects include:

- Children's Health Survey for Asthma (CHSA)
- Child Health Information Reporting Project (CHIRP) [CHSA-C development/testing]
- Rethinking Child Health Supervision (RCHS)
- National Survey of Early Childhood Health – Revision and Enhancement
- Responsibility for ADHD Management Project (RAMP)

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Funding, to date, for the project has been provided by the AAP Friends of Children Fund, the Agency for Healthcare Research and Quality, the Arthritis Foundation, The Commonwealth Fund, Fisons Pharmaceuticals, the Genentech Foundation for Growth and Development, The Gerber Foundation, GlaxoSmithKline, the National Heart, Lung, and Blood Institute, New England Medical Center through the auspices of the Henry J. Kaiser Family Foundation, the Packard Foundation, Ronald McDonald Children's Charities, SmithKline Beecham, and Eli Lilly and Company.
INTRODUCTION TO THE CHILDREN’S HEALTH SURVEY FOR ASTHMA

WHY A CHILDREN’S HEALTH SURVEY FOR ASTHMA?

The measurement of pediatric health-related quality of life (HRQOL) is an important and expanding area in health care and health services research. Tools to assess functional status or HRQOL go beyond traditional physiological measures by incorporating a multidimensional definition of health that encompasses physical, psychological and social aspects. Application of these measures includes describing the health status of pediatric populations, examining the outcomes of various conditions and treatment methods, and potentially improving clinical decision-making by capturing the broader impact of disease and treatment based on child and parent perspectives.

The prevalence of asthma in the pediatric population, combined with the financial, social and emotional costs to children and their families provided impetus for the development of the Children’s Health Survey for Asthma (CHSA). The CHSA is a valid and reliable measurement tool to assess the impact of asthma and treatment on the lives of children and their families.

To date, over 600 copies of the CHSA parent-report instrument have been disseminated to pediatricians and health services researchers. The measure has also been used in several large, federally-funded studies including the Pediatric Asthma Care PORT II.

HOW WAS THE CHSA DEVELOPED?

Constructing sound measurement tools is a complex process that requires careful scientific development and testing -- generally a process that takes several years. The process of CHSA development and testing involved several stages:

Stage 1: Instrument Development
An initial instrument was drafted by Academy researchers based on a review of existing literature and input from an expert work group comprised of members from appropriate Academy Sections. The measure was further refined through feedback from physicians, parents, and research consultants.

Stage 2: Pilot Testing
Cognitive interviews with parents (the "think aloud" method of interviewing respondents, in-depth, about their interpretation of survey questions) and pilot tests in the offices of volunteer physicians were used to evaluate and revise the initial instrument. The purpose of piloting the measure was to assess the feasibility of questions, obtain frequencies of responses, and conduct preliminary validation analyses.
A second round of cognitive interviews were conducted with particular attention to performance of the measure with low-income and minority group parents.

With the assistance of five volunteer sites, a second pilot test was completed to reduce survey length and further scale development and scoring.

Stage 3: Field Testing
The goal of field testing was to maximize the qualities of reliability, validity, and responsiveness, as well as to reduce the number of survey items. Longitudinal, repeated-measure field studies allowed a comparison of changes in health-related quality of life to changes in clinical status.

In September 1996, the Functional Outcomes Project was awarded a subcontract on a Pediatric Asthma Care Patient Outcomes Research Team II (PAC-PORT II) grant (funded by the Agency for Health Care Policy and Research and the National Heart, Lung, and Blood Institute) entitled, “A Cost-Effectiveness Study of the Use of Guideline Management in Asthma Care” (Kevin Weiss, MD, MPH, Principal Investigator, Lynn Olson, PhD, Co-Principal Investigator). This project used the CHSA in clinical trials and allowed the Academy to make publicly available a reliable, valid and responsive measure.

The resulting instrument is a self-report measure completed by parents of children with chronic asthma between the ages of 5 and 16. The CHSA can be used alone or as a companion to the child-completed CHSA-C.

Asthma-specific domains include physical health (child), activity (child and family), and emotional health (child and family). Additional items cover health care utilization, asthma triggers, and family demographics.

In 2002, a US Spanish linguistic validation of the CHSA was conducted by Mapi Research Institute and included forward-backward translation by professional translators, consolidation, and pilot testing. A full report on translation methods is available on request. Support for the translation project was provided by GlaxoSmithKline.

Financial support for the development and testing of the CHSA was provided by the New England Medical Center through the auspices of the Henry J. Kaiser Family Foundation, AAP Friends of Children Fund, Fisons Pharmaceuticals, the Agency for Health Care Policy and Research, the National Heart, Lung, and Blood Institute, GlaxoSmithKline, and the Packard Foundation.
CHSA Publications


CHSA Selected Presentations


Asmussen, L, Olson, LM, Weiss, K, Grant, E, & Arduino, K. (1999). The *Children’s Health Survey for Asthma (CHSA)*: Comparison of self- and telephone administered versions. Poster presented at the annual meeting of the American College of Allergy, Asthma and Immunology, Chicago, IL.

Asmussen, L, Olson, LM, Weiss, K, Grant, E, & Arduino, K. (1999). A Tool for Understanding the Impact of Pediatric Asthma: The *Children’s Health Survey for Asthma (CHSA)*. Poster presented at the American Academy of Allergy, Asthma and Immunology’s “Pediatric Asthma: From Policy to Practice” meeting, Washington, DC.

Asmussen, L, Olson, LM, Grant, E, Weiss, K, and Arduino, K. (1999). Does recall period matter? Use of 2, 4 and 8-week recollection in the *Children’s Health Survey for Asthma*. Poster presented at the annual meeting of the Association for Health Services Research, Chicago, IL.


FACT SHEET
CHILDREN’S HEALTH SURVEY FOR ASTHMA

- A condition-specific health status/outcomes instrument
- Developed for parents/guardians of children with chronic asthma between the ages of 5 and 16 years
- 48 core scale items; computed into 5 domain scores to assess child physical health, activity (child & family), and emotional health (child and family)
- Includes optional items on health care utilization, asthma triggers, and family demographics
- Self or interviewer-administered
- Appropriate for in-person or telephone administration
- Suitable for cross-sectional or longitudinal study designs
- Professionally assessed at the 6th grade reading level (self-administered version)
- Appropriate and tested for applications such as treatment assessment or comparisons, educational interventions, clinical trials
- **Not** tested for health system accreditation, health system monitoring, physician “report cards,” credentialing, profiling, or diagnosing health conditions
- Available at no cost in noncommercial research or practice applications
- US-Spanish version available

**CHSA VERSIONS AVAILABLE**

**English**

CHSA – Parent self-administered (2-, 4-, or 8-week recall period)

CHSA – Interviewer-administered (2-, 4-, or 8-week recall period)

**US Spanish**

CHSA – Parent self-administered (2-, 4-, or 8-week recall period)

CHSA – Interviewer-administered (2-, 4-, or 8-week recall period)
INTRODUCTION TO THE CHILDREN’S HEALTH SURVEY FOR ASTHMA – CHILD VERSION

WHY A CHILDREN’S VERSION OF THE CHSA?

Whether to collect patient-reported, health status data from parents or children is an important question in both pediatric research and clinical practice. For children who are too young or too ill to respond, parents are often the logical respondents to report on their child’s health status. Given the challenges involved in gaining information from children, such as comprehensibility, response biases and time constraints, many pediatric health status measures have relied on parent report as a proxy for the child.¹

While parent report is critical to understanding asthma’s impact on the family and in circumstances where children are too young or ill to report for themselves, parents provide an indirect account of child symptoms and feelings. Children and adolescents are typically apart from parents for many hours each day, thus parent assessments may be incomplete.

There is growing recognition and emerging evidence that children can and should provide input on their own health status.² ³ The most comprehensive picture of disease burden and impact is likely obtained by a combination of parent and child report but few companion measures exist that capture similar content from both parent and child. In their online guide to quality of life instruments, the American Thoracic Society’s⁴ review of 17 pediatric measures, only three⁵ ⁶ ⁷ collect data from parent and child. Further, particularly for child-completed instruments, published findings of reliability and validity estimates are limited.

HOW WAS THE CHSA-C DEVELOPED?

Based on positive response generated by the CHSA and requests for a companion instrument for child completion, we embarked on the Child Health Information Reporting Project (CHIRP). Funded by the National Heart, Lung, and Blood Institute, CHIRP was designed not only to create a child-friendly instrument but also to explore a question of considerable debate in

⁴ American Thoracic Society. Quality of Life Resource. Available at: http://www.atsqol.org/sections/specific-diseases/pediatric-asthma.html#condition

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outcome measurement – *at what age do children become dependable reporters of their own health status?*

To explore whether children and adolescents can validly and reliably report on their own health status, we assessed acceptability of child-report asthma-related health status questionnaires to children and parents, feasibility of questionnaire administration to and completion by children, and age-specific psychometric quality of asthma-related health status data obtained from children using a child-report version of the *Children's Health Survey for Asthma – Child Version (CHSA-C)*.

**Stage 1: Instrument Development and Qualitative Review**
The CHSA-C was adapted from the Child Health Survey for Asthma (CHSA) parent-completed instrument. Team members reviewed the CHSA and made numerous child-friendly modifications, such as wording changes, a calendar review to facilitate understanding of a 2-week recall period (used throughout the CHSA-C) and visual representation of Likert-type response choices. Thirty-nine one-on-one interviews with children (ages 7 through 11) and parents of children with asthma were conducted to determine whether terminology and questionnaire design was appropriate and understandable to children. The CHSA-C was assessed by reading and education experts to be at a 3rd grade (typical 8-9 year old) reading level.

**Stage 2: Quantitative Testing**
The larger study assessed psychometric properties of the CHSA with a diverse sample of over 400 children, 7-16 years of age. Child questionnaires were interviewer administered to all children; 10-16 year olds also self-completed the CHSA-C. Interviews with the parent and child were conducted separately. To put child participants at ease, they were assured that the questions were not intended to test their asthma knowledge. The concept of 2-week recall (as used throughout the CHSA-C) was explained by reviewing a blank calendar of the previous 2 weeks, noting any important events (not limited to asthma) that had occurred for the child during that period. Response choice cards were also used with children, so that they could either verbalize their answers or point to the circles that corresponded to their answers.

Analysis of key psychometric indicators revealed good to excellent reliability and validity. Further, these performance characteristics were evident regardless of child gender, race/ethnicity and household income. See Publications (below) for additional information on psychometric properties and methods used.

The resulting instrument is an interviewer-administered (children ages 7-16 years) or self-completed (children ages 10-16 years) measure for children with asthma. The CHSA-C can be used alone or as a companion to the parent-completed CHSA.

Asthma-specific domains assessed include child physical health, child activities, and child emotional health. Additional items cover health care utilization, asthma triggers, and child demographics.
CHSA-C Publications

Olson LM, Radecki L, Frintner MP, Weiss KB, Korfmacher J, Siegel RM. At what age can children report dependably on their asthma health status? Pediatrics 2007; 119(1):e93-e102. (Full text available online: http://pediatrics.aappublications.org/cgi/content/full/119/1/e93)


CHSA-C Selected Presentations

(Abstracts available online: http://www.aap.org/research/Chirppresentations.htm)


FACT SHEET
CHILDREN’S HEALTH SURVEY FOR
ASTHMA – CHILD VERSION

WHAT IS THE CHILDREN’S HEALTH SURVEY FOR ASTHMA-CHILD VERSION (CHSA-C)?

- A condition-specific health status/outcomes instrument
- Developed for children with chronic asthma ages 7-16 years
- 25 core scale items; computed into 3 domain scores to assess asthma-related child physical health, child activity, and child emotional well-being
- Includes optional items on health care utilization, asthma triggers, and child demographics
- Interviewer-administered appropriate for children 7-16 years of age
- Self-administered appropriate for children 10-16 years of age
- Suitable for cross-sectional or longitudinal study designs
- Self-administered version professionally assessed at the 3rd grade reading level
- Appropriate and tested for applications such as treatment assessment or comparisons, educational interventions, clinical trials
- Not tested for health system accreditation, health system monitoring, physician “report cards,” credentialing, profiling, or diagnosing health conditions
- Available at no cost in noncommercial research or practice applications

CHSA-C VERSIONS AVAILABLE

English

CHSA-C – Interviewer or Self-Administered (2-week recall period)
The Children’s Health Survey for Asthma includes 48 core items that are used to compute 5 scales:

- Physical Health (child) – 15 items (6a 6b 6c 6d 6e 6f 6g 10a 10b 10c 10d 10e 10f 10g 10h)
- Activities (child) – 5 items (14a 14b 15a 15b 15c)
- Activities (family) – 6 items (17a 17b 17c 18a 18b 18c)
- Emotional Health (child) – 5 items (12a 12b 12c 12d 12e)
- Emotional Health (family) – 17 items (19a 19b 19c 19d 19e 20a 20b 20c 20d 20e 20f 22a 22b 22c 22d 22e 22f)

Additional survey items address such issues as health care utilization and family characteristics but are not required for scale computation.

Computed scale scores are transformed so that possible scale scores range from 0-100. Higher scores indicate better or more positive outcomes.

The general steps for scale construction are follows:

1) Set all out-of-range values to missing

2) Use only those cases that have valid responses for ½ (if scale includes even # of items) or ½ + 1 (if scale includes odd # of items) of the individual scale items

3) Compute raw mean scale score by adding all items and dividing the total score by the total number of items completed

4) Transform raw mean scale score on a 0-100 scale by subtracting the raw mean scale score from the minimum item response value (1), multiplied by 100 and divided by maximum possible (5) minus minimum possible (1) item response value (or 5-1=4)

Score computation using SPSS and SAS syntax is provided below.

**NOTE:** It is strongly recommended that CHSA users administer scales *in their entirety*. If you are unable to administer the full questionnaire, do not shorten the measure by selecting individual items from each scale. Rather, if survey length is a concern, we encourage users to determine which scale or scales are of most importance to the hypotheses and interests of the project and to use those scales in their entirety. Previous statistical testing of the CHSA is based solely on the scale computations outlined in this manual. Therefore, the reliability, validity and responsiveness of any altered version of the questionnaire are unknown and results will not be comparable to existing data.
SPSS Scoring Syntax for 5 CHSA Scales

recode 6a 6b 6c 6d 6e 6f 6g 10a 10b 10c 10d 10e 10f 10g 10h (1=1) (2=2) (3=3) (4=4) (5=5) (else=sysmis).
count phnum=6a 6b 6c 6d 6e 6f 6g 10a 10b 10c 10d 10e 10f 10g 10h (1,2,3,4,5).
recode 6a 6b 6c 6d 6e 6f 6g 10a 10b 10c 10d 10e 10f 10g 10h (sysmis=0).
do if (phnum ge 8).
compute phtrans=(6a + 6b + 6c + 6d + 6e + 6f + 6g + 10a + 10b + 10c + 10d + 10e + 10f + 10g + 10h)/phnum.
compute PH=((phtrans-1)/4)*100.
variable labels PH 'CHSA Physical Health Scale (0-100)'.
end if.

recode 14a 14b 15a 15b 15c (1=1)(2=2)(3=3)(4=4)(5=5)(else=sysmis).
count acnum=14a 14b 15a 15b 15c (1,2,3,4,5).
recode 14a 14b 15a 15b 15c(sysmis=0).
do if (acnum ge 3).
compute actrans=(14a + 14b + 15a + 15b + 15c)/acnum.
compute AC=((actrans-1)/4)*100.
variable labels AC 'CHSA Activity (child) Scale (0-100)'.
end if.

recode 17a 17b 17c 18a 18b 18c (1=1)(2=2)(3=3)(4=4)(5=5)(else=sysmis).
count afnum=17a 17b 17c 18a 18b 18c (1,2,3,4,5).
recode 17a 17b 17c 18a 18b 18c(sysmis=0).
do if (afnum ge 3).
compute aftrans=(17a + 17b + 17c + 18a + 18b + 18c)/afnum.
compute AF=((aftrans-1)/4)*100.
variable labels AF 'CHSA Activity (family) Scale (0-100)'.
end if.

recode 12a 12b 12c 12d 12e (1=1) (2=2) (3=3) (4=4) (5=5)(else=sysmis).
count ecnum=12a 12b 12c 12d 12e (1,2,3,4,5).
recode 12a 12b 12c 12d 12e(sysmis=0).
do if (ecnum ge 3).
compute ectrans=(12a + 12b + 12c + 12d + 12e)/ecnum.
compute EC=((ectrans-1)/4)*100.
variable labels EC 'CHSA Emotional Health (child) Scale (0-100)'.
end if.
recode 19a 19b 19c 19d 19e 20a 20b
  20c 20d 20e 20f 22a 22b 22c 22d
  22e 22f (1=1)(2=2)(3=3)(4=4)(5=5)(else=sysmis).
count efnum=19a 19b 19c 19d 19e 20a 20b
  20c 20d 20e 20f 22a 22b 22c 22d
  22e 22f (1,2,3,4,5).
recode 19a 19b 19c 19d 19e 20a 20b
  20c 20d 20e 20f 22a 22b 22c 22d
  22e 22f (sysmis=0).
do if (efnum ge 9).
compute eft=(19a + 19b + 19c + 19d + 19e
  + 20a + 20b + 20c + 20d + 20e + 20f + 22a
  + 22b + 22c + 22d + 22e + 22f)/efnum.
compute EF=((eft-1)/4)*100.
variable labels EF 'CHSA Emotional Health (family) Scale (0-100)'.
end if.
SAS Scoring Syntax for 5 CHSA Scales

array fivept 6a 6b 6c 6d 6e 6f
   6g 10a 10b 10c 10d 10e 10f
   10g 10h;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating PH raw score mean;
PHn=n(6a,6b,6c,6d,6e,6f,
   6g,10a,10b,10c,10d,10e,10f,
   10g,10h);
if PHn lt 8 then phraw=.;else
   phraw=mean(6a,6b,6c,6d,6e,6f,
   6g,10a,10b,10c,10d,10e,10f,
   10g,10h);
*****transforming PH to 100;
min=1; max=5;
PH=(phraw-min)*100/(max-min);
label PH='CHSA Physical Health Scale (0-100)';

array fivept 14a 14b 15a 15b 15c;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating AC raw score mean;
ACn=n(14a,14b,15a,15b,15c);
if ACn lt 3 then acraw=.;else
   acraw=mean(14a,14b,15a,15b,15c);
*****transforming AC to 100;
min=1; max=5;
AC=(acraw-min)*100/(max-min);
label AC='CHSA Activities [child] Scale (0-100)';

array fivept 17a 17b 17c 18a 18b 18c;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating AF raw score mean;
AFn=n(17a,17b,17c,18a,18b,18c);
if AFn lt 3 then afraw=.;else
   afraw=mean(17a,17b,17c,18a,18b,18c);
*****transforming AF to 100;
min=1; max=5;
AF=(afraw-min)*100/(max-min);
label AF='CHSA Activity [family] Scale (0-100)';

array fivept 12a 12b 12c 12d 12e;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating EC raw score mean;
ECn=n(12a,12b,12c,12d,12e);
if ECn lt 3 then ecraw=.;else
ecraw=mean(12a,12b,12c,12d,12e);
*****transforming EC to 100;

min=1; max=5;
EC=(ecraw-min)*100/(max-min);
label EC='CHSA Emotional Health [child] Scale (0-100)';

array fivept 19a 19b 19c 19d 19e 20a
20b 20c 20d 20e 20f 22a 22b 22c 22d 22e 22f;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating EF raw score mean;
EFn=n(19a,19b,19c,19d,19e,20a,
20b,20c,20d,20e,20f,22a,22b,
22c,22d,22e,22f);
if EFn lt 9 then efraw=.;else
efraw=mean(19a,19b,19c,19d,19e,20a,
20b,20c,20d,20e,20f,22a,22b,22c,
22d,22e,22f);
*****transforming EF to 100;

min=1; max=5;
EF=(efraw-min)*100/(max-min);
label EF='CHSA Emotional Health [family] Scale (0-100)';
CHILDREN’S HEALTH SURVEY FOR ASTHMA – CHILD VERSION
SCALE SCORING INSTRUCTIONS

The Children’s Health Survey for Asthma-Child Version (CHSA-C) includes 25 core items that are used to compute 3 scales:

- Physical Health – 7 items (4a 4b 4c 4d 4e 4f 4g)
- Child Activities – 6 items (9a 9b 9c 10a 10b 10c)
- Child Emotional Health – 12 items (11a 11b 11c 11d 11e 11f 11g 11h 12a 12b 12c 12d)

Additional survey items address such issues as health care utilization and family characteristics but are not required for scale computation.

Computed scale scores are transformed so that possible scale scores range from 0-100. Higher scores indicate better or more positive outcomes.

The general steps for scale construction are follows:

1) Set all out-of-range values to missing

2) Use only those cases that have valid responses for ½ (if scale includes even # of items) or ½ + 1 (if scale includes odd # of items) of the individual scale items

3) Compute raw mean scale score by adding all items and dividing the total score by the total number of items completed

4) Transform raw mean scale score on a 0-100 scale by subtracting the raw mean scale score from the minimum item response value (1), multiplied by 100 and divided by maximum possible (5) minus minimum possible (1) item response value (or 5-1=4)

Score computation using SPSS and SAS syntax is provided below.

NOTE: It is strongly recommended that CHSA-C users administer scales in their entirety. If you are unable to administer the full questionnaire, do not shorten the measure by selecting individual items from each scale. Rather, if survey length is a concern, we encourage users to determine which scale or scales are of most importance to the hypotheses and interests of the project and to use those scales in their entirety. Previous statistical testing of the CHSA-C is based solely on the scale computations outlined in this manual. Therefore, the reliability, validity and responsiveness of any altered version of the questionnaire are unknown and results will not be comparable to existing data.
SPSS Scoring Syntax for 3 CHSA-C Scales

**NOTE:** Before creating the CHSA-C Emotional Health scale score, item #12d (“I know which medicines to take for my asthma”) must be reverse coded (e.g., 1=5, 2=4, 3=3, 4=2, 5=1) for consistency with the direction of other items in the scale.

```spss
recode 4a 4b 4c 4d 4e 4f 4g (1=1) (2=2) (3=3) (4=4) (5=5) (else=sysmis).
count cphnum=4a 4b 4c 4d 4e 4f 4g (1,2,3,4,5).
recode 4a 4b 4c 4d 4e 4f 4g (sysmis=0).
do if (cphnum ge 4).
compute cphtrans=(4a + 4b + 4c + 4d + 4e + 4f + 4g)/cphnum.
compute CPH=((cphtrans-1)/4)*100.
variable labels CPH 'CHSA-C Child Physical Health Scale (0-100)'.
end if.

recode 9a 9b 9c 10a 10b 10c (1=1)(2=2)(3=3)(4=4)(5=5)(else=sysmis).
count cacnum=9a 9b 9c 10a 10b 10c (1,2,3,4,5).
recode 9a 9b 9c 10a 10b 10c (sysmis=0).
do if (cacnum ge 3).
compute cactrans=(9a + 9b + 9c + 10a + 10b + 10c)/cacnum.
compute CAC=((cactrans-1)/4)*100.
variable labels CAC 'CHSA-C Child Activity Scale (0-100)'.
end if.

recode 11a 11b 11c 11d 11e 11f 11g 11h 12a 12b 12c 12d
(1=1)(2=2)(3=3)(4=4)(5=5)(else=sysmis).
count cehnum=11a 11b 11c 11d 11e 11f 11g 11h 12a 12b 12c 12d (1,2,3,4,5).
recode 11a 11b 11c 11d 11e 11f 11g 11h 12a 12b 12c 12d (sysmis=0).
do if (cehnum ge 6).
compute cehtrans=(11a + 11b + 11c + 11d + 11e + 11f + 11g + 11h + 12a + 12b + 12c + 12d)/cehnum.
compute CEH=((cehtrans-1)/4)*100.
variable labels CEH 'CHSA-C Child Emotional Health Scale (0-100)'.
end if.
```
SAS Scoring Syntax for 3 CHSA-C Scales

**NOTE: Before creating the CHSA-C Emotional Health scale score, item #12d ("I know which medicines to take for my asthma") must be reverse coded (eg, 1=5, 2=4, 3=3, 4=2, 5=1) for consistency with the direction of other items in the scale

array fivept 4a 4b 4c 4d 4e 4f 4g;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating CPH raw score mean;
CPHn=n(4a, 4b, 4c, 4d, 4e, 4f, 4g);
if CPHn lt 4 then cphraw=.;else
cphraw=mean(4a, 4b, 4c, 4d, 4e, 4f, 4g);
*****transforming CPH to 100;

min=1; max=5;
CPH=(cphraw-min)*100/(max-min);
label CPH='CHSA-C Child Physical Health Scale (0-100)';

array fivept 9a 9b 9c 10a 10b 10c;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating CAC raw score mean;
CACn=n(9a, 9b, 9c, 10a, 10b, 10c);
if CACn lt 3 then cacraw=.;else
cacraw=mean(9a, 9b, 10a, 10b, 10c);
*****transforming CAC to 100;

min=1; max=5;
CAC=(cacraw-min)*100/(max-min);
label CAC='CHSA-C Child Activities Scale (0-100)';

array fivept 11a 11b 11c 11d 11e 11f 11g 11h 12a 12b 12c 12d;
do over fivept; if fivept lt 1 or fivept gt 5 then fivept=.;
end

*****making those missing more than half missing on scale and creating CEH raw score mean;
CEHn=n(11a, 11b, 11c, 11d, 11e, 11f, 11g, 11h, 12a, 12b, 12c, 12d);
if CEHn lt 6 then cehraw=.;else
cehraw=mean(11a, 11b, 11c, 11d, 11e, 11f, 11g, 11h, 12a, 12b, 12c, 12d);
*****transforming CEH to 100;

min=1; max=5;
CEH=(cehraw-min)*100/(max-min);
label CEH='CHSA-C Child Emotional Health Scale (0-100)';
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For questions regarding CHSA/CHSA-C copyright issues, please contact:

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The Children’s Health Survey for Asthma (CHSA) and Children’s Health Survey for Asthma-Child Version (CHSA-C) have been tested prior to public release in different types of projects with diverse groups of people. While there is no single answer to which mode of administration or study protocol procedures are optimal, these types of decisions are most appropriately determined for individual projects by their investigators. It is likely that the best data collection practices are those that fit closest with study goals and that result in the most complete data set obtained with the least burden to participants.

The following general suggestions are provided for those who may be less familiar with data collection procedures and research methodology to encourage the successful collection of high quality data:

- **Maintain consistent data collection procedures between study participants.**

  While it is not always easy, even under the most well-controlled studies, to replicate conditions and procedures under which respondents provide data, every effort should be made to control the setting and circumstances in which participants are asked to complete data collection forms. Such consistency will help avoid the introduction of unnecessary bias that might affect response or participation.

- **Keep method of questionnaire administration consistent both between respondents and throughout the study.**

  The CHSA should be administered to each study participant in the same way, whether the method of choice is self-completion or interviewer- (telephone or in-person) administration. Likewise, if the study design calls for data collection at multiple points in time, the mode of administration should be constant across data collection periods.

  Although the CHSA has been tested under different administration methods, there is not yet enough data to confirm that there are no response differences based on self- or interviewer administration.

  NOTE: The CHSA-C has been tested only as an interviewer-administered instrument with children 7-9 years of age and as an interviewer-administered and self-completed instrument for youth 10-16 years of age. Telephone administration of the CHSA-C has not been tested.

- **Train research assistants in appropriate data collection protocol**

  Even the most thoughtfully designed study is destined to fail without the support of a carefully trained research staff on the “front lines” to implement protocol. Regardless of study and staff size, it is imperative that all researchers involved in any aspect of data collection be prepared to follow a standardized data collection protocol to maximize consistency in questionnaire administration across respondents and minimize potential biases. In addition to correctly carrying out the data collection protocol, research assistants should be instructed in ways to establish a professional rapport with respondents without being overly friendly or unfriendly. Further, researchers should be trained to avoid verbal and nonverbal personal
reactions to participant responses, both in the course of discussion and during CHSA/CHSA-C administration. Again, this may be challenging for less experienced assistants or when working with children but maintaining neutrality in voice, comment, and body language is imperative to quality data collection.

After learning about interviewing skills and techniques, less experienced researchers should also have an opportunity to practice the data collection protocol with colleagues and simulated respondents. Hypothetical “problem” situations and possible solutions should be reviewed and practiced as well. It cannot be emphasized enough that practice is a helpful strategy to foster comfort with the data collection protocol. Even those well-acquainted with data collection methods can benefit from such reminders and review as someone overly familiar with a data collection protocol or instrument can become careless in consistent administration procedures.

- **Administer the CHSA/CHSA-C exactly as provided**

A benefit to users of the CHSA/CHSA-C is the assurance that the instrument has undergone extensive statistical testing prior to public release. Previous testing, however, is based upon use of the CHSA/CHSA-C in its current form. Therefore, users are strongly encouraged to administer the CHSA/CHSA-C without changes to wording or questionnaire order. The addition of new probes or other commentary should also be discouraged when using the interviewer-administered version. Making alterations without prior consent from the authors is a violation of copyright law.

The user familiar with the CHSA will recognize that the questionnaire is organized largely around a core set of items used to compute 5 scales (Physical health, Activity [child], Activity [family], Emotional health [child] and Emotional health [family]). Similarly, the CHSA-C includes a set of items computed to create 3 scales (Physical Health, Child Activities and Child Emotional Health). To maintain uniformity with the previously tested scales, all items used to construct a particular scale must be administered as provided. Nothing is known about the statistical properties of any deviation from the scales as published within the CHSA User’s Guide.

An optional set of questions related to background/demographic characteristics and healthcare utilization are provided and may be included or omitted at the discretion of the investigator **(SEE SCALE SCORING INSTRUCTIONS FOR ADDITIONAL INFORMATION)**.

If you have any questions about items required for scale computation, please contact the Child Health Measurement Project's Senior Research Associate at 847/434-7625 or dorchmp@aap.org.

- **Encourage respondents to complete all CHSA/CHSA-C items**

As is common in the administration of many surveys, some participants may question the need to answer all items noting that certain questions seem repetitive or sound alike. In this situation, participants should be reassured that the surveys were developed with input from many parents and children with asthma and that each question is included because we are interested in learning as much as possible about the daily lives of children with asthma and their families.

Respondents can be gently encouraged to complete all items by stressing the importance of their responses because no one knows their child or family like they do. Participants should
understand, however, that they are not required to complete the CHSA/CHSA-C or any item they may feel uncomfortable answering. Respondents must also be made aware that their decision to complete or not complete the CHSA/CHSA-C will not affect the medical care or related services they receive.

At questionnaire completion, researchers can be encouraged to scan the CHSA/CHSA-C quickly for any missing data. If an omitted item is noticed, the respondent can be asked, politely, if he/she meant to leave the item blank. Often, a skipped question is merely an oversight on the part of the respondent.

Scale scores can be computed for respondents whose questionnaires include limited amounts of missing data but a complete CHSA/CHSA-C for all respondents is always preferable.

- **Don’t “help” respondents with the CHSA/CHSA-C**

  Whether the CHSA/CHSA-C is interviewer- or self-administered, it may be tempting, especially for less experienced researchers to provide assistance to respondents who have questions about the definition of terms or how a question relates to the respondent’s child or family. To avoid any bias that might be introduced by an interviewer’s comments or possible differences in responses that might be offered by different researchers, each person responsible for questionnaire administration should be instructed to provide no additional information. Acceptable responses, as appropriate, might include statements like, “Whatever (term) means to you,” “Whichever response answers the question best for your child and/or your family,” “We just want to know what you think and how you feel about these things,” or “There are no right or wrong answers.”

  If a participant seems frustrated by or “stuck” on a particular question and the researcher’s initial response is not sufficient to help the respondent move along, the participant can then be instructed to leave the item blank. Suggesting that a question be skipped, however, should be a last resort.

- **Discourage discussion or “questionnaire sharing” between parent and child during CHSA/CHSA-C administration**

  In previous testing of the CHSA, we have noticed a tendency (especially among some parents of older children) to consult with the child while completing the questionnaire. This may take the form of the parent simply asking for and recording the child’s responses (as opposed to their own response) or the parent discussing issues from the questionnaire with the child and recording a shared answer on the CHSA based on input from both parent and child. Without negating the importance of the child’s opinions, respondents should be reminded that the purpose of the questionnaire is to obtain their thoughts and feelings about living with a child with asthma and encouraged to complete the questionnaire on their own. During our own testing of the CHSA-C, we conducted parent and child interviews in separate rooms so participants could not share information or consult about their answers.

- **Schedule completion of the CHSA/CHSA-C prior to any asthma-related discussions or meetings**

  If the CHSA/CHSA-C is administered in a medical setting or in a setting in which multiple participants are present, the CHSA/CHSA-C should be administered prior to any discussion with health care professionals or other parents. Unless a certain type of discussion or
meeting is a distinct part of the study design to be assessed, a goal in completion of the CHSA/CHSA-C is to obtain respondents’ thoughts and opinions without any bias that might be introduced through discussion with others.

- **Allow adequate time for questionnaire completion**

  The reading level of the self-report CHSA has been professionally evaluated to be at the 6th grade level and in past tests, the majority of respondents have found the measure quick and easy to complete. In planning the data collection protocol, however, investigators are encouraged to pre-test the questionnaire and overestimate the amount of time needed for completion, especially if the CHSA is to be self-administered. Reading speed, comprehension and response time can vary widely among participants even in a relatively homogeneous sample.

  The reading level of the CHSA-C has been professional assessed at the 3rd grade level.

- **Give attention to setting and logistics**

  Although seemingly inconsequential or trivial, the setting in which data is collected can impact the quality of information received. While it is not always possible for researchers to control every aspect of the location in which questionnaire administration occurs, efforts should be made to provide an area that is comfortable, well-lit and large enough to accommodate the participant and any accompanying child(ren) or other adults. A hard writing surface (eg, clipboard or lap desk) is also useful if respondents are not seated at a table.

- **Use color coded response cards for individual items to decrease respondent burden**

  Users familiar with the CHSA will recognize that the questionnaire’s individual items rely on five different sets of response choices. Each of the different sets includes 5 Likert-type responses -- too much for some participants to accurately recall over the course of an interview. For ease of in-person interviewer administration, consider using large-print, color-coded response choice cards. These cards can be handed to participants at the appropriate time allowing respondents to keep choices in mind while avoiding cumbersome and annoying repetition of response choices for each individual item.

  In testing the CHSA-C, we provided cards that included both response choice text as well as graduated circles corresponding to each response choice.

An excellent resource on data collection methods that may benefit investigators is: