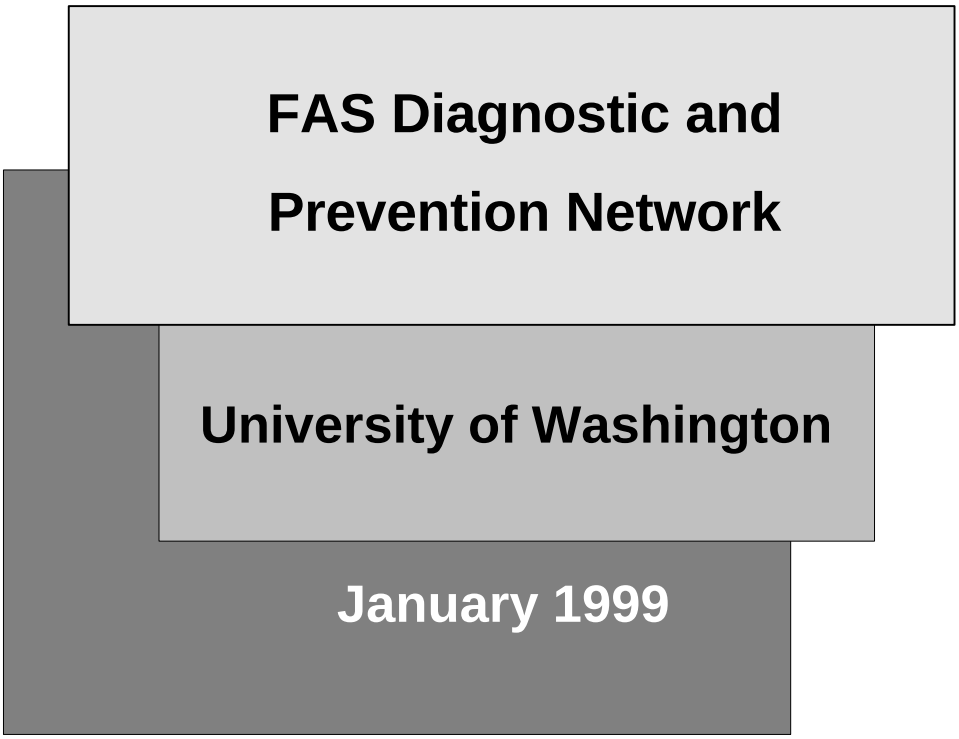
Diagnostic Guide for Fetal Alcohol Syndrome and Related Conditions

The 4-Digit Diagnostic Code

Second Edition



Diagnostic Guide for Fetal Alcohol Syndrome and Related Conditions: The 4-Digit Diagnostic Code, 2nd Edition 1999.

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Contents

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Preface

This Diagnostic Guide is the second edition. Based on our own experience and feedback from others, we continue to make modifications that enhance accuracy, improve clarity, and increase ease of usage. We hope you will find this new approach to the diagnosis of individuals with fetal alcohol exposure helpful and broadly applicable.

I. Introduction

Fetal alcohol syndrome (FAS).

FAS is a permanent birth defect syndrome caused by maternal consumption of alcohol during pregnancy. The definition of the fetal alcohol syndrome has changed little since the 1970's when the condition was first described and refined [1,2,3,4]. The condition has been broadly characterized by pre- and/or postnatal growth deficiency, a characteristic set of minor facial anomalies, and evidence of prenatal alteration in brain function such as microcephaly from birth, neurologic problems without postnatal antecedents, or complex patterns of functional disability.

The difficulty with diagnosing FAS and other disabilities associated with in utero alcohol exposure.

For the trained clinician, dysmorphologist, or clinical geneticist there is little difficulty in making the diagnosis of FAS when the typical anomalies in growth, face, and brain are all extreme and the alcohol exposure is conclusive and substantial. But the physical, cognitive and behavioral features are not dichotomous, that is either normal or clearly abnormal. Rather, the features, and indeed the history of alcohol exposure, all range along separate continua from normal to clearly abnormal and distinctive.

In the absence of accurate, reproducible and unbiased methods for measuring and recording the severity of exposure and outcome in individual patients, diagnoses will continue to vary widely from clinic to clinic. From a clinical perspective, diagnostic misclassification leads to inappropriate patient care, increased risk for secondary disabilities[5] and missed opportunities to achieve prevention. From a public health perspective, diagnostic misclassification leads to inaccurate estimates of incidence and prevalence. Inaccurate estimates thwart efforts to allocate sufficient social and health care services to this high-risk population and preclude accurate assessment of primary prevention intervention efforts. From a clinical research perspective, diagnostic misclassification reduces the power to identify between-group contrasts within studies. Non-standardized diagnostic methods limit the ability to compare outcomes between studies.

The primary limitations in the current practice of diagnosing individuals with prenatal alcohol exposure include:

1. There is no standardized clinical definition of FAS. Rather, there are diagnostic guidelines that physicians and medical researchers are encouraged to follow, but the guidelines are not sufficiently *specific* to assure diagnostic accuracy or precision.

   According to the latest proposed diagnostic guidelines published by Sokol and Clarren[3] which are a minor modification of the 1980 definition of FAS by the Fetal Alcohol Study Group of the Research Society for Alcoholism [6]:

"The diagnosis of FAS can only be made when the patient has signs of abnormality in each of the three categories: 1) Prenatal and/or postnatal growth retardation (weight and/or length below the 10th percentile when corrected for gestational age), 2) central nervous system involvement (including neurological abnormality, developmental delay, behavioral dysfunction or deficit, intellectual impairment and/or structural abnormalities, such as microcephaly (head circumference below the 3rd percentile) or brain malformations found on imaging studies or autopsy and 3) a characteristic face, currently qualitatively described as including short palpebral fissures, an elongated midface, a long and flattened philtrum, thin upper lip, and flattened maxilla."

Although these descriptions do provide guidance, they are not sufficiently specific to assure diagnostic accuracy and precision. The guidelines for CNS dysfunction do not address how many areas of deficit must be present, how severe the deficits must be or what level of documentation must exist to substantiate the presence of the deficit (i.e., parental history, psychometric testing or structural imaging). The guidelines for the facial phenotype are equally nonspecific. How many facial features must be present, how severe must the features be and what scale of measurement should be used to judge their severity? One need only read the clinical literature or review medical records, birth certificates, birth defect registries or ICD-9 codes to see how variably these criteria are interpreted, applied and reported [7,8,9,10,11].

2. There is a lack of objective, quantitative scales to measure and report the magnitude of expression of key diagnostic features.

   For example, although a thin upper lip and smooth philtrum are key diagnostic features[12], quantitative measurement scales have never been used to measure thinness or smoothness and guidelines have never been established for how thin or smooth the features must be. Objective quantitative scales would not only improve accuracy and precision, but would also establish a common descriptive language for communicating outcomes in medical records and the medical literature.

3. The term FAS fails to convey the diversity of disability present in individuals with FAS.

   No two individuals with FAS present with the same constellation of anomalies and disabilities. Growth, facial phenotype, CNS dysfunction and alcohol exposure all vary along separate continua. The term FAS only conveys that the condition is permanent and was caused by prenatal alcohol exposure. The term does not convey what the individual's disabilities are. A nomenclature that better conveys the diversity of outcomes among individuals with prenatal exposure would benefit both the patient's caregivers and their medical/social/educational care network.

4. The term fetal alcohol effects (FAE) is broadly used and poorly defined.

   The term 'suspected fetal alcohol effects' was first introduced into the medical literature in 1978 and was defined as 'less complete partial expressions' of FAS in individuals with prenatal alcohol exposure[2]. Based on this definition, an individual whose mother drank a few glasses of wine

intermittently throughout pregnancy and presented with attention deficit hyperactivity disorder would be diagnosed FAE. So would an individual whose mother drank a fifth of vodka daily throughout pregnancy and presented with microcephaly, severe mental retardation, cleft palate and severe growth deficiency. The broad use of this term and the reluctance to abandon it points to the clear need to develop diagnostic terms for individuals with prenatal alcohol exposure who present with physical anomalies and/or cognitive/behavioral disabilities, but do not have FAS. New diagnostic terms, which more finely differentiate the variable exposures and outcomes of these individuals without implying alcohol as the sole causal agent, are needed.

5. Clinical terms like FAE[13], alcohol related birth defects (ARBD)[4] and alcohol related neurodevelopmental disorder (ARND)[4] inappropriately imply a causal link between exposure and outcome in a given individual. Leading dysmorphologists in the field of FAS diagnosis have formally requested that the term FAE no longer be used for this reason[13].

   With the likely exception of the facial phenotype, no other physical anomalies or cognitive/behavioral disabilities observed in an individual with prenatal alcohol exposure are necessarily specific to (caused only by) their prenatal alcohol exposure. Features such as microcephaly, neurological abnormalities, attention deficit, mental retardation and growth deficiency often occur in individuals with prenatal alcohol exposure, but also often occur in individuals with no prenatal alcohol exposure.

A new approach to diagnosis.

Each of the above limitations has been overcome with the development the "*4-Digit Diagnostic Code*" introduced in this guide. The four digits reflect the magnitude of expression of four key diagnostic features of FAS in the following order: (1) growth deficiency, (2) the FAS facial phenotype, (3) brain dysfunction, and (4) gestational alcohol exposure. The magnitude of expression of each feature is ranked independently on a 4-point Likert scale with 1 reflecting complete absence of the FAS feature and 4 reflecting a strong "classic" presence of the FAS feature.

Benefits of the new diagnostic approach.

This new approach:

1. Greatly increases diagnostic precision and accuracy through the use of objective, quantitative measurement scales and specific case definitions.

2. Better characterizes the full spectrum of disabilities of alcohol exposed individuals who do and do not have FAS.

3. Documents the presence of alcohol exposure without judging its causal role.

4. Provides a quantitative measurement and reporting system that can be used independent of the clinical case definitions.

While this document might at first appear overly complex and perhaps daunting, one will find that this new diagnostic approach is logical and easy to use and will greatly facilitate the proper description and classification of patients presenting with all possible combinations of outcomes and exposure.

Other syndromes

The methods of diagnosing fetal alcohol syndrome and related conditions arise from the larger fields of teratology and dysmorphology (clinical genetics). It is essential to remember that isolated features in many birth defect syndromes overlap with FAS. A few examples of conditions often easily confused with FAS include Aarskog syndrome, fragile-x syndrome, fetal hydantoin syndrome and Noonan syndrome. Furthermore it is likely that this diagnostic approach to organizing dysmorphic features and issues of cognitive and behavioral problems could be used for patients exposed to other potentially teratogenic substances instead of or in addition to alcohol. This diagnostic guide is "FAS specific" but this in no way should imply that the diagnostician need not consider alternate syndromic diagnoses and medical conditions at all times.

II. FAS Diagnostic Evaluation Form

The FAS Diagnostic Evaluation Form guides the clinical team in the collection, recording, and interpretation of all key information used to derive an accurate and precise diagnosis. Although the most accurate diagnoses are derived when complete information is available across all domains, complete information is not always available or obtainable. This is especially true with psychometric assessments. Although space has been provided to record a full complement of assessments, we are not implying that all of these assessments must be conducted to derive a diagnosis. It is the responsibility of the clinical team to select the most appropriate psychometric assessment battery.

The form also serves as a template for efficient generation of the final medical summary note.

Where is the information for the Diagnostic Form obtained from?

The information recorded in the Diagnostic Form is obtained from four primary sources:

1. The New Patient Information Form completed by the caregivers (Appendix 1).
2. Medical/psychological/educational assessments conducted prior to the diagnostic evaluation.
3. Assessments administered by the clinical staff at the time of the diagnostic evaluation.
4. The caregiver/patient interview conducted at the time of the diagnostic evaluation

When is the form completed and by whom?

The form is completed by the clinical staff before and during the patient's clinic visit. Typically, the clinician completes the following sections: growth, structural and neurologic brain function, facial features, alcohol exposure and co-morbidities. The occupational therapist, psychologist and language pathologist complete the psychometric measures of brain function and the results of the caregiver interview are completed by the clinician and psychologist.

FAS Diagnostic Evaluation Form

Medical # _____ Clinic _____ Date seen in Clinic ___ / ___ / ___

Patient's Name: _____ _____ _____ Age(y) _____ Birth Date ___ / ___ / ___
First Middle Last

Name person(s) accompanying patient _____

Relationship(s) to patient _____ Patient's Gender M F

Patient's Race/Ethnicity: _____

Form completed by: _____

Diagnosis made by: _____

Diagnosis(es): _____

_____

_____

4-Digit Diagnostic Code Grid

(See instructions in Diagnostic Guide for FAS and Related Conditions)

Growth Deficiency	FAS Facial Features	Brain Dysfunction		Growth	Face	Brain	Alcohol		Gestational Alcohol
significant	severe	definite	4					4	high risk
moderate	moderate	probable	3					3	some risk
mild	mild	possible	2					2	unknown
none	absent	unlikely	1					1	no risk

GROWTH

At Birth

Birth weight: _____ (gms) _____ (lbs/oz.), _____ (centile) for gestational age

Birth length _____ (cm) _____ (inches), _____ (centile) for gestational age

Gestational age at birth_____ (weeks)

Highest Weight and Height Centiles Recorded

wgt _____(kg), _____(lbs), _____ (centile), age _____(yr)

hgt _____(cm), _____(inches), _____ (centile), age _____(yr), parent adjustment _____(cm)

Lowest Weight and Height Centiles Recorded

wgt _____(kg), _____(lbs), _____ (centile), age _____(yr)

hgt _____(cm), _____(inches), _____ (centile), age _____(yr), parent adjustment _____(cm)

Current Weight and Height

wgt _____(kg), _____(lbs), _____ (centile), age _____(yr)

hgt _____(cm), _____(inches), _____ (centile), age _____(yr), parent adjustment _____(cm)

Birth Parent's Heights

mother's hgt _____(cm)_____(inches), father's hgt _____(cm)_____(inches), mid-parent hgt _____(cm)

ABC-Score for Growth Deficiency

See instructions in the "Diagnostic Guide for FAS" for deriving the ABC-score for growth and translating it into a 4-Digit Diagnostic Code

Circle the ABC Scores for:

	Height	Weight
≤ 3rd centile = **C**	C	C
>3rd and ≤ 10th centile = **B**	B	B
> 10th centile = **A**	A	A

This ABC Score reflects the patient's growth between _____ years and _____ years of age.

FACIAL FEATURES (and other physical findings)

CURRENT PHENOTYPE: (Age _____ yrs)

Direct measures

Right palpebral fissure length (PFL) _____ (cm) _____ (z-score)

Left palpebral fissure length (PFL) _____ (cm) _____ (z-score)

Inner canthal distance (ICD) _____ (cm) _____ (z-score)

	Not Present		*Mildly Present*		*Definitely Present**	
Flat philtrum*	_____ 1	_____ 2	_____ 3	_____ 4	_____ 5 (*flat*)	
Thin upper lip*	_____	_____	_____	_____	_____ (*thin*)	

Clinic Photograph **Internal Measure** True size _____ Units (_____)

Was a facial photograph taken? Yes ___, No ___ Size in photo _____ Units (_____)

Right PFL Length in photo _____ (pixels or mm): True estimate _____ (cm) _____ (z-score)

Left PFL Length in photo _____ (pixels or mm): True estimate _____ (cm) _____ (z-score)

ICD Length in photo _____ (pixels or mm): True estimate _____ (cm) _____ (z-score)

	Not Present		*Mildly Present*		*Definitely Present*	Upper Lip
Flat philtrum*	_____ 1	_____ 2	_____ 3	_____ 4	_____ 5 (*flat*)	Circularity**
Thin upper lip*	_____	_____	_____	_____	_____ (*thin*)	_____

PAST PHENOTYPE (Age _____ yrs) **Internal Measure** True size _____ Units (_____)

Source of data (photograph ___, text record ____) Size in photo _____ Units (_____)

Right PFL Length in photo _____ (pixels or mm): True estimate _____ (cm) _____ (z-score)

Left PFL Length in photo _____ (pixels or mm): True estimate _____ (cm) _____ (z-score)

ICD Length in photo _____ (pixels or mm): True estimate _____ (cm) _____ (z-score)

	Not Present		*Mildly Present*		*Definitely Present*	Upper Lip
Flat philtrum*	_____ 1	_____ 2	_____ 3	_____ 4	_____ 5 (*flat*)	Circularity**
Thin upper lip*	_____	_____	_____	_____	_____ (*thin*)	_____

Facial D-score** _____ Dscore = 0.7408 – 5.7337 (Largest PFL/ICD) + 1.1677 (philtrum Likert rank) + 0.1587 (upper lip Likert rank)

(Use Lip-Philtrum Guide on page 26, Figure 1)* * (See Astley & Clarren, 1996)*

ABC-SCORE for Facial Phenotype

See instructions in the "Diagnostic Guide for FAS" for deriving the ABC Score and translating it into a 4-Digit Diagnostic Code

5-Point Likert Scale for Philtrum & Lip	Z-score for Largest Palpebral Fissure	*Circle the ABC Scores for:* Palpebral Fissure	Smooth Philtrum	Thin Upper Lip
4 or 5	≤ -2 SD	C	C	C
3	>-2 SD and ≤ -1 SD	B	B	B
1 or 2	> -1 SD	A	A	A

ALL ADDITIONAL PHYSICAL ANOMALIES ON THE BODY

_____

_____ Page 2 of 7

BRAIN FUNCTION

Examiner's Clinical Judgment of Severity of Outcome
Circle: 0 = Unable to Judge, 1 = Normal, 2 = Mildly Abnormal, 3 = Severely Abnormal

Severity

STRUCTURAL

0 1 2 3 OFC _____ (cm) _____ (centile) at _____ (years) of age.

0 1 2 3 Structural anomalies on CT/MRI _____

0 1 2 3 Other: _____

NEUROLOGIC

0 1 2 3 Seizure Disorder: type _____ Age at onset _____ (yrs)

0 1 2 3 Gross motor _____

0 1 2 3 Fine motor _____

0 1 2 3 Quick Neurological Screening Test score _____

0 1 2 3 Other neurologic signs _____

PSYCHOMETRIC *Provide most recent test scores*

0 1 2 3 **Intellectual**: (test/version) _____ Age _____ (yr/mos)

FSIQ or equiv. ____ VIQ _____PIQ _____ PercOrg _____ VerbComp _____ FreeDis _____

Inf. ___ Sim. ___ Arith. ___ Voc. ___ Comm. ___ Dig. ___ Pict C. ____ Pict. A. ___ Blo. ___ Obj. ___ Cod. ___ Maz. ___

_____

_____ Age(s) of previous intelligence tests _____ (yrs)

0 1 2 3 **Achievement** (test/version) _____ Age _____ (yr/mos)

Subtest	Score	Type of Score (standard, %, age equiv., T, Z, etc)

Age(s) of previous Achievement tests _____ (yrs)

0 1 2 3 **Adaptation** (test/version) _____ Age _____ (yr/mos)

Composite Score Name	Score	Type of Score (standard, %, age equiv., T, Z, etc)

Subtest		

Age(s) of previous Adaptation tests _____ (yrs)

See the "Diagnostic Guide for FAS" for instructions on deriving the 4-Digit Diagnostic Code for Brain Dysfunction

BRAIN FUNCTION (Continued)

Examiner's Clinical Judgment of Severity of Outcome

Circle: 0 = Unable to Judge, 1 = Normal, 2 = Mildly Abnormal, 3 = Severely Abnormal

Severity

0 1 2 3 **Psychiatric Diagnoses:** ADHD / ADD (____ yes, _____no, _____ unknown)

other (*specify*) _____

_____

Medication(s)	Response (+, -, none)	Medication(s)	Response (+, -, none)

0 1 2 3 **Neuropsychological** (e.g., VMI, CVLT-C, Halstead-Reitan, WRAML, Rey, Bender-G, Luria-Nebraska, etc)

Test name	Score	Type of Score (standard, %, age equiv., T, Z, etc)	Age (yr/months)

0 1 2 3 **Language**

Test name	Score	Type of Score (standard, %, age equiv., T, Z, etc)	Age (yr/months)

0 1 2 3 Mental State Reasoning Test [14, 15] Age _____ (yr/mos)

1st Order (Belief _____ Justification _____) 2nd Order (Belief _____Justification _____)

0 1 2 3 Narrative Test [14, 15] Age _____ (yr/mos)

Bus Story _____ Frog Story _____

0 1 2 3 **Developmental** (test/version) _____ Age _____ (yr/mos)

Subtest	Score	Type of Score (standard, %, age equiv., T, Z, etc.)

See the "Diagnostic Guide for FAS" for instructions on deriving the 4-Digit Diagnostic Code for Brain Dysfunction

BRAIN FUNCTION (Continued)

Examiner's Clinical Judgment of Severity of Outcome

Circle: 0 = Unable to Judge, 1 = No, Normal 2 = Yes, Mildly Abnormal, 3 = Yes, Severely Abnormal

Severity **CAREGIVER INTERVIEW** *These observations are intended to support, not define, clinical impressions*

Planning

0 1 2 3 Needs considerable help organizing daily tasks
0 1 2 3 Cannot organize time,
0 1 2 3 Doesn't understand concept of time
0 1 2 3 Difficulty in carrying out multi-step tasks
0 1 2 3 Other _____

Behavioral Regulation/ Sensory Motor Integration

0 1 2 3 Poor management of anger / tantrums
0 1 2 3 Mood swings
0 1 2 3 Impulsive
0 1 2 3 Compulsive
0 1 2 3 Perseverative,
0 1 2 3 Inattentive
0 1 2 3 Inappropriately [high or low] activity level
0 1 2 3 Lying/stealing
0 1 2 3 Unusual [high or low] reactivity to [sound touch light]
0 1 2 3 Other _____

Abstract Thinking / Judgment

0 1 2 3 Poor judgment
0 1 2 3 Cannot be left alone
0 1 2 3 Concrete, unable to think abstractly
0 1 2 3 Other _____

Memory / Learning / Information Processing

0 1 2 3 Poor memory, inconsistent retrieval of learned information
0 1 2 3 Slow to learn new skills
0 1 2 3 Does not seem to learn from past experiences
0 1 2 3 Problems recognizing consequences of actions
0 1 2 3 Problems with information processing speed and accuracy
0 1 2 3 Other _____

Spatial Memory

0 1 2 3 Gets lost easily, has difficulty navigating from point A to point B
0 1 2 3 Other _____

Social Skills and Adaptive Behavior

0 1 2 3 Behaves at a level notably younger than chronological age
0 1 2 3 Poor social/adaptive skills
0 1 2 3 Other _____

Motor/Oral Motor Control

0 1 2 3 Poor/delayed motor skills
0 1 2 3 Poor balance
0 1 2 3 Other _____

0 1 2 3 **Behavioral/Social Competence:** (test) _____ Age _____ (yr/mos)

Subtest	Score	Type of Score (standard, %, age equiv., T, Z, etc)

See the "Diagnostic Guide for FAS" for instructions on deriving the 4-Digit Diagnostic Code for Brain Dysfunction

MATERNAL ALCOHOL USE

Alcohol consumption of the birth mother

Before pregnancy: Average number of drinks per drinking occasion: _____

Maximum number of drinks per occasion: _____

Average number of drinking days per week: _____

Type of alcohol consumed ___Wine, ___ Beer, ___ Liquor, ___ Unk., ___ Other *(specify)* _____

During pregnancy: Average number of drinks per drinking occasion: _____

Maximum number of drinks per occasion: _____

Average number of drinking days per week: _____

Type of alcohol consumed ___ Wine, ___ Beer, ___ Liquor, ___ Unk., ___ Other *(specify)* _____

Trimester(s) in which alcohol was consumed ____ 1st ____ 2nd ____ 3rd ____ Unk. ____ None

	No	Suspected	Yes	Unknown
Was the birth mother ever diagnosed with alcoholism?	___	_____	___	_____
Was the birth mother ever reported to have a problem with alcohol?	___	_____	___	_____
Did the birth mother ever receive treatment for alcohol addiction?	___	_____	___	_____
Was alcohol use during this pregnancy positively confirmed?	___	_____	___	_____

If, yes, source of confirmation _____

Reported use of alcohol during pregnancy is: ___ Reliable, ___ Somewhat reliable, ___ Of unknown reliability

Other information about alcohol use during pregnancy: _____

_____

_____

4-DIGIT RANK for Alcohol Exposure

4-Digit Diagnostic Code Rank	Gestational Alcohol Exposure Category	Description
4	High Risk	● Alcohol use during pregnancy CONFIRMED *and* ● Exposure pattern is consistent with the medical literature placing the fetus at "high risk" (generally high peak blood alcohol concentrations delivered at least weekly in early pregnancy).
3	Some Risk	● Alcohol use during pregnancy CONFIRMED *and* ● Drinking occurred in gestation in frequencies and volumes less than in category (4) or exact amounts unknown.
2	Unknown Risk	● Gestational exposure is simply not known or information is of questionable reliability
1	No Risk	● Alcohol use during pregnancy is CONFIRMED to be completely ABSENT.

Circle the 4-Digit Diagnostic Code Rank in the table above that best reflects the patient's gestational Alcohol Exposure Category

CO-MORBIDITIES

PRENATAL

High risk	Some risk	Unknown risk	No risk
4	3	2	1

See the "Diagnostic Guide for FAS" for instructions on deriving the rank for Prenatal Co-morbidities

Prenatal

1. Poor prenatal care: _____ No _____ Suspected _____ Yes _____ Unknown
2. Complications/trauma (specify) _____

Genetics

1. Parental learning difficulties (e.g. Special Ed., ADD, MR, did not complete high school, etc.)

   Mother _____ No _____ Suspected _____ Yes _____ Unknown

   Father _____ No _____ Suspected _____ Yes _____ Unknown

   If yes, specify Maternal _____

   Paternal _____
2. Other conditions of heritability or malformation that may be significant in this case. *(specify)*

   _____

Other Potentially Teratogenic Exposures

_____

_____

POSTNATAL

High risk	Some risk	Unknown risk	No risk
4	3	2	1

See the "Diagnostic Guide for FAS" for instructions on deriving the rank for Postnatal Co-morbidities

Perinatal Difficulties

_____

_____

Issues of Nurture

1. Abuse: Physical _____ Sexual _____
2. Number of home placements _____
3. Other (e.g., neglect, adverse home environment, etc) _____

   _____

   _____

   _____

Other Issues That Could Explain Brain Dysfunction (e.g., head injuries, fever, chronic substance abuse, etc.)

_____

_____

_____

FAS Diagnostic and Prevention Network
Preliminary Summary and Recommendations

The final medical summary will be sent to you in approximately two weeks.

Patient Name: _____ Clinic: _____

Birth Date: _____ / _____ / _____ Clinic Date: ____ / ____ / ____ Clinic phone: _____

Diagnostic Outcome: _____

Result(s) of assessment(s) performed in Clinic (if applicable):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Recommendations for Follow-Up

A. Medical Issues

_____

_____

_____

_____

_____

_____

_____

FAS Diagnostic and Prevention Network
Preliminary Summary and Recommendations

Patient Name: _____ Birth Date: _____ / _____ / _____

Recommendations for Follow-Up

B. Developmental, Educational, Vocational, Mental Health, and Family Issues

III. Diagnostic Evaluation Form Instructions

A. The 4-Digit Diagnostic Code

What are the 4 Digits?

The four digits reflect the magnitude of expression of the four key diagnostic features of FAS in the following order: (1) growth deficiency, (2) the FAS facial phenotype, (3) brain dysfunction, and (4) gestational alcohol exposure. The 4-Digit Diagnostic Code is generated at the completion of the diagnostic evaluation using information recorded on the FAS Diagnostic Evaluation Form. The code is derived following the directions in Sections III. B. 1 through B. 4.

4-Digit Diagnostic Code Grid

3 4 4 4

significant	severe	definite	(4)		X	X	X	(4)	high risk
moderate	moderate	probable	(3)	X				(3)	some risk
mild	mild	possible	(2)					(2)	unknown
none	absent	unlikely	(1)					(1)	no risk
Growth Deficiency	**FAS Facial Features**	**Brain Dysfunction**		Growth	Face	Brain	Alcohol		**Gestational Alcohol**

The 4-Digit Diagnostic Code 3444 inserted in the grid is one of twelve that qualifies as a diagnosis of FAS.

How are the 4 Digits ranked?

The magnitude of expression of each feature is ranked independently on a 4-point Likert scale with 1 reflecting complete absence of the FAS feature and 4 reflecting a strong "classic" presence of the FAS feature. Specific guidelines for ranking the magnitude of each of the FAS features are presented in Section III.B.

How many 4-Digit Diagnostic Codes are there?

There are 256 possible 4-Digit Diagnostic Codes ranging from 1111 to 4444. The 256 codes and their corresponding clinical names are listed in numerical order in Section VI.

We have created diagnostic categories for all potential codes, even though to date we do not expect to see all of these situations in clinic. For example, 1111 reflects a normal exam in an individual who was definitely not exposed to alcohol. Such patients are seen by primary physicians daily, but are unlikely to be referred to a FAS clinic. Other codes like 4441 would represent a “classic” clinical presentation of FAS with a confirmed absence of alcohol exposure during gestation. We have never seen such a case (or phenocopy), but we may some day.

How many different Clinical Diagnostic Categories are there?

Each 4-Digit Diagnostic Code falls into one of 22 unique Clinical Diagnostic Categories (labeled A through V). A list of the 22 Diagnostic Categories is presented in Section IV. A list of the 4-Digit Diagnostic Codes, which fall within each Clinical Diagnostic Category, is presented in Section V.

What are the names of the Clinical Diagnostic Categories?

The following terms are used in varying combinations to name the 22 diagnostic categories. They include:

- **Sentinel Physical Findings:**
  The adjective *"sentinel"* refers to physical findings that are key diagnostic features of FAS. These include a unique cluster of minor facial anomalies (short palpebral fissures, thin upper lip and a smooth philtrum) and growth deficiency. Other physical findings (major or minor anomalies) may be detected instead of or in addition to these sentinel findings that may suggest alternate or additional conditions. There are places on the Diagnostic Evaluation Form to record and interpret other physical findings.

- **Static Encephalopathy:**
  The term *"encephalopathy"* refers to any physical abnormality in the brain. Such abnormalities can vary in magnitude from structural defects that are apparent on an image like a CT scan to micro-cellular abnormalities that can only be confirmed with tissue samples or neurochemical analysis. The term *"static"* means that the physical abnormality in the brain is unchanging, neither progressing nor regressing. The term *"static encephalopathy"* is used in this diagnostic system when the patient presents with cognitive/behavioral dysfunction which is accompanied by structural, neurologic, and/or psychometric measures which strongly support the presence of structural brain abnormalities. The term does not define or suggest any specific pattern of structural abnormality or cognitive/behavioral dysfunction.

- **Neurobehavioral Disorder:**
  This term is used in this diagnostic system when the patient presents with cognitive/behavioral dysfunction, but structural, neurologic and psychometric measures do not unequivocally support the presence of structural brain abnormalities.

- **Alcohol (Exposed, Not Exposed, Exposure Unknown):**
  This term is used to reflect the exposure status of the fetus. It is reported <u>independent</u> of outcome and does not imply a causal association between exposure and outcome.

- **Fetal Alcohol Syndrome:**
  The term FAS is used to refer to patients who present with one of twelve 4-Digit Diagnostic Code combinations reflecting growth deficiency, the FAS facial phenotype and brain dysfunction.

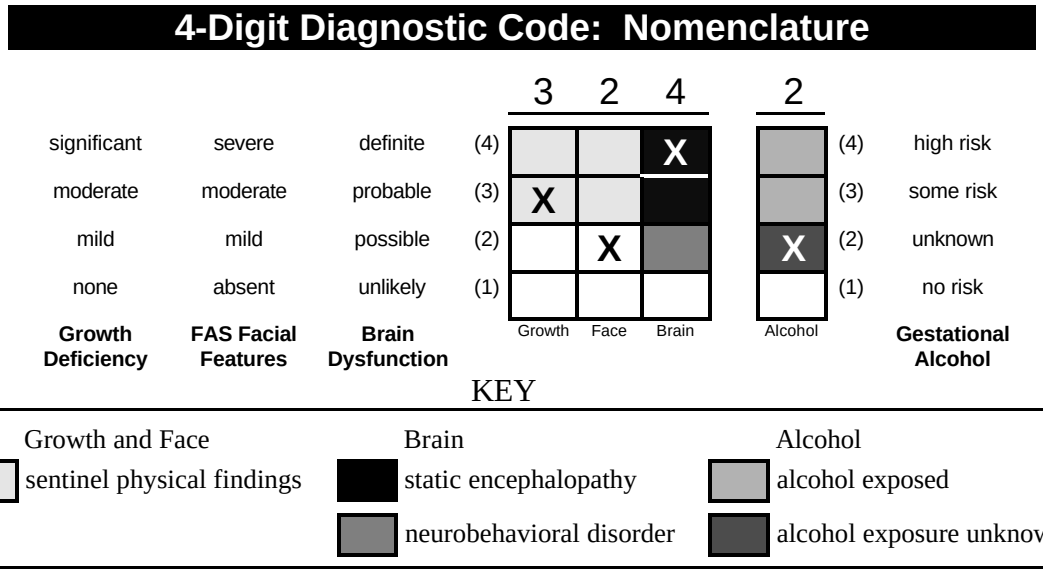
- **Atypical Fetal Alcohol Syndrome:**
  This term is introduced for use with a relatively small group of patients who have static encephalopathy, most of the sentinel physical findings of FAS, and were alcohol exposed. Given the fact that variable presentation is the rule rather than the exception after teratogenic exposure in gestation, we felt it was appropriate to establish this marginal category.

The names assigned to each diagnostic category reflect the patient's clinical outcome and alcohol exposure. The names are listed in Sections IV and V. The first three categories (A through C) meet the criteria for a clinical diagnosis of FAS and are named as such. The fourth category (D) applies to the patient who presents with all of the features of FAS, but has a confirmed *absence* of gestational alcohol exposure. This category is referred to as a FAS Phenocopy and has yet to be observed.

The remaining 19 categories (E through V) do not meet the minimum criteria for FAS and are subsequently named to reflect the Likert ranking of each digit in the 4-Digit Diagnostic Code. For example, a code of 4333 is the Diagnostic Category called "*sentinel physical findings / static encephalopathy (alcohol exposed)*". Many of these patients might have previously been referred to variably as having possible fetal alcohol effects (PFAE), alcohol related birth defects (ARBD), or alcohol related neurodevelopmental disorder (ARND). This new nomenclature supersedes all of these terms.

How are the Clinical Diagnostic Category names constructed?

- Growth deficiency and facial characteristics are physical features. When either feature receives a rank of 3 or 4, *sentinel physical findings* is placed at the beginning of the name.
- When brain dysfunction receives a rank of 2, the term *neurobehavioral disorder* is included in the name. When brain dysfunction receives a rank of 3 or 4, the term *static encephalopathy* is included in the name.
- When alcohol exposure receives a rank of 3 or 4, (*alcohol exposed*) is placed at the end of the name. When alcohol exposure receives a rank of 2, (*alcohol exposure unknown*) is placed at the end of the name.



The 4-Digit Code 3242 would receive the clinical name *sentinel physical findings / static encephalopathy / alcohol exposure unknown*. A code of 1223 would receive the clinical name *neurobehavioral disorder / alcohol exposed.*

Which new Diagnostic Categories represent the category we use to call FAE?

Diagnostic Categories E through I would have previously been referred to as "fetal alcohol effects", "alcohol related birth defects" or "alcohol related neurobehavioral disorder". Categories J through V are new categories that describe a large number of patient groups who have never been adequately classified or described in the past.

How do you explain the diagnosis to the patient?

At the end of this manual (Section VII) are summary explanations for each of the 22 Clinical Diagnostic Categories. These summaries can be used as the first page of the patient's final medical summary note.

III. Diagnostic Evaluation Form Instructions

B.1. Scoring Growth Deficiency

What type of growth deficiency are we looking for?

We are looking for growth deficiency characteristic of a teratogenic insult, not characteristic of postnatal environmental factors such as nutritional deprivation or chronic illness. We want to answer the question *'What is the patient's growth potential after controlling for parental height and postnatal environmental influences?'* Growth deficiency of teratogenic origin is likely to present as a relatively consistent impairment over time (i.e., the patient's growth follows the normal curve, but is below genetic expectation for family background). In contrast, growth deficiency due to postnatal environmental influences is likely to present as periodic fluctuations in the curve. Separating the two growth patterns requires astute clinical judgment.

The method described below allows one to rank a patient's overall growth pattern on a single 4-point Likert scale with 1 equal to normal and 4 equal to significantly deficient. Not all patients will have complete growth curves available, therefore, a guide is provided below for prioritizing the ranking of the patient's growth over a lifetime

Method for ranking the growth component of the 4-Digit Diagnostic Code

A. Height should be age and gender adjusted and should be adjusted for parental height, if possible.

B. Weight should be age and gender adjusted. Weight is not adjusted for height. Normal growth charts are provided in Section VIII.

C. For ranking purposes, the growth curve is separated into two parts:
   1. Prenatal growth (birth measures)
   2. Postnatal growth (all measures collected after birth)

   Select the part of the growth curve with the greatest deficiency in the height centile.

   If the prenatal height centile is lower than all postnatal height centiles, proceed to section D for instructions on how to rank prenatal growth.

   If any of the postnatal height centiles are lower than the prenatal height centile, select the point or consecutive points on the curve that reflect the lowest height centiles that cannot be attributed to postnatal environmental influences such as nutritional deprivation or chronic illness. If the height deficiency is reflected in a series of points on the curve, as opposed to a single point, rank the level of deficiency based on the centile range where the majority of the points fall. Proceed to section D for instructions.

D. Rank the level of deficiency of the height and weight centiles for the section of the curve with greatest deficiency in the height centile by circling A, B or C in the ABC-Score table at the bottom of page 1 of the FAS Diagnostic Evaluation Form. This ABC-Score table is duplicated below as Table 1.

Table 1: Deriving the ABC-Score for Growth

Centile Range	Circle the ABC-Score for: Height	Weight
≤ 3rd	C	C
>3rd and ≤ 10th	B	B
>10th	A	A

E. Next, refer to Table 2 to determine the *4-Digit Diagnostic Code Rank* of the Height-Weight ABC-Score recorded in Table 1. Transfer the resulting 4-Digit Diagnostic Code Rank for growth to the 4-Digit Diagnostic Code Grid at the top of page 1 of the FAS Diagnostic Evaluation Form.

Table 2: Converting the Growth ABC-Score to a 4-Digit Diagnostic Code Rank for Growth

4-Digit Diagnostic Code Rank	Growth Deficiency Category	Height-Weight ABC-Score Combinations
4	Severe	CC
3	Moderate	CB, BC
2	Mild	CA, BB, AC
1	None	BA, AB, AA

Example for Scoring Growth Deficiency

Patient's Growth Record:

	Age (years)	Height Centile	Weight Centile
birth	0.0	5 %	2 %
	1.5	10 %	15 %
	5.0	12 %	20 %
	7.0	12 %	10 %
	15.5	15 %	30 %

Assume the clinical records rule-out any environmental influence on postnatal measures.

Scoring:

- Priority would be placed on ranking the birth measures because the birth height centile is lower than all postnatal height centiles recorded.
- Birth height would be ranked **$\geq 3^{rd}$ and $\leq 10^{th}$** (or Rank B) in Table 1.
  Birth weight would be ranked **$\leq 3^{rd}$** (or Rank C) in Table 1.

Table 1: Deriving the ABC Score for Growth

	Circle the ABC-Scores for:	
Centile Range	Height	Weight
$\leq 3^{rd}$	C	**C**
$>3^{rd}$ and $\leq 10^{th}$	**B**	B
$>10^{th}$	A	A

- The Height-Weight ABC-Score would be **BC** according to Table 2.
- The Growth Deficiency Category would be **Moderate** according to Table 2.
- Moderate growth deficiency receives a rank of **3** in the 4-Digit Diagnostic Code in Table 2.

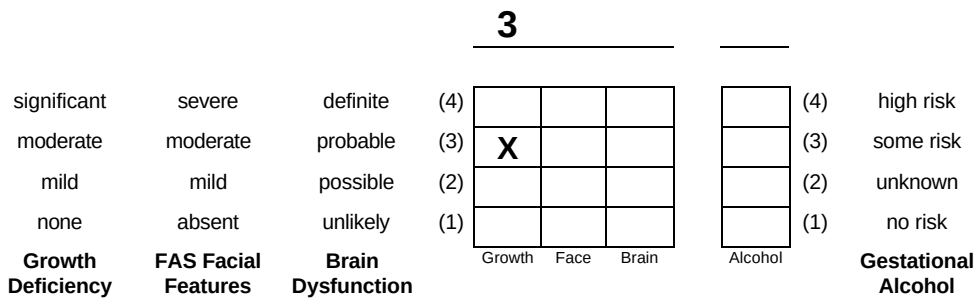
Table 2: Converting the Growth ABC-Score to a 4-Digit Diagnostic Code Rank for Growth

4-Digit Diagnostic Code Rank	Growth Deficiency Category	Height-Weight ABC-Score Combinations
4	Severe	CC
3	**Moderate**	CB, **BC**
2	Mild	CA, BB, AC
1	None	BA, AB, AA

The number **3** would be transferred to the 4-Digit Diagnostic Code Grid on page 1 of the FAS Diagnostic Evaluation Form (as duplicated below).

Result:

4-Digit Diagnostic Code Grid



III. Diagnostic Evaluation Form Instructions

B.2. Scoring the Facial Phenotype

Method for ranking the facial phenotype component of the 4-Digit Diagnostic Code

A. The largest palpebral fissure length (PFL) is measured and ranked according to its z-score (or how many standard deviations above or below the norm it is). The palpebral fissures are adjusted for age and when possible, race. Eyes must be wide open to obtain accurate measures[16, 17]. A normal palpebral fissure length chart is provided in Section VIII[18].

B. The upper lip and philtrum are measured independently using the 5-point pictorial Likert scale presented on the Lip-Philtrum Guide (Figure 1). Lips must be gently closed with no smile to obtain accurate measures (Figure 2)[17]. The physician's eyes must be in the patient's Frankfort Horizontal plane (represented by a line drawn from the external auditory canal to the lower border of the orbital rim). This is crucial for accurate measurement of upper lip thinness (Figure 3)

C. Rank the size, smoothness and thinness of the fissures, philtrum, and upper lip respectively by circling A, B, or C in each column in the ABC-Score table at the bottom of page 2 of the FAS Diagnostic and Evaluation Form. This table is duplicated below as Table 3.

Table 3: Deriving the ABC-Score for Facial Phenotype

5-Point Likert Scale for Philtrum & Lip	Z-score* for Largest Palpebral Fissure	Circle the ABC-Scores for: Palpebral Fissure	Philtrum	Upper Lip
4 or 5	≤ -2 SD	C	C	C
3	>-2 SD and ≤ -1 SD	B	B	B
1 or 2	> -1 SD	A	A	A

* z-score = (patient PFL - normal population PFL)/(normal population PFL standard deviation)

D. Next, refer to Table 4 to determine the *4-Digit Diagnostic Code Rank* based on the ABC-Score derived from Table 3. Transfer the resulting 4-Digit Diagnostic Code Rank for face to the 4-Digit Diagnostic Code Grid on page 1 of the FAS Diagnostic Evaluation Form.

Table 4: Converting the Facial ABC-Score to a 4-Digit Diagnostic Code Rank for Face

4-Digit Diagnostic Code Rank*	Level of Expression of FAS Facial Features	Palpebral Fissure - Philtrum - Lip ABC-Score Combinations
4	Severe	CCC
3	Moderate	CCB, CBC BCC
2	Mild	CCA, CAC, CBB, CBA, CAB, CAA BCB, BCA, BBC, BAC ACC, ACB, ACA, ABC, AAC
1	Absent	BBB, BBA, BAB, BAA ABB, ABA, AAB, AAA

* If facial measures are available at more than one age, score the age when the FAS phenotype is expressed the most. If FAS features are never expressed, score the face between the ages of 3 and 10 years, or at any age if this age range is not available.

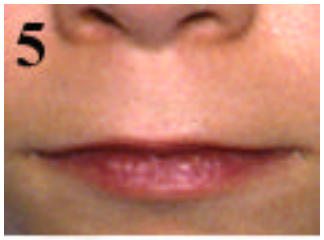
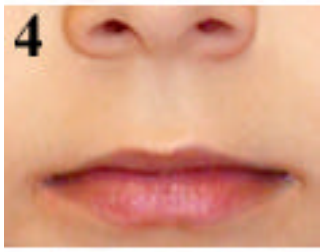
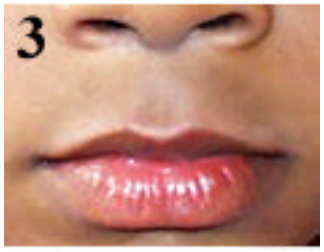
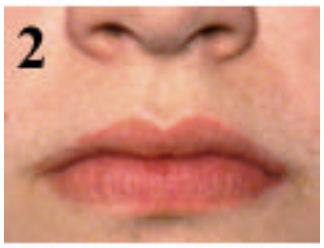
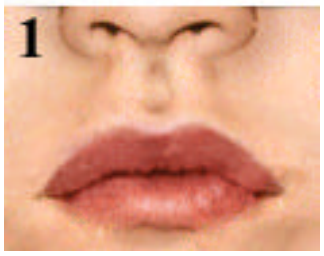
Lip – Philtrum Guide 5-Point Likert Ranks	ABC-Scores Philtrum Smoothness	Upper Lip Thinness	Upper Lip Circularity[12]
	C	C	178
	C	C	80
	B	B	65
	A	A	50
	A	A	35

Figure 1. Pictorial examples of the 5-point Likert scales and the ABC scale used to rank upper lip thinness and philtrum smoothness. It is important that the individual's lips are gently closed with no smile as illustrated in Figure 2.

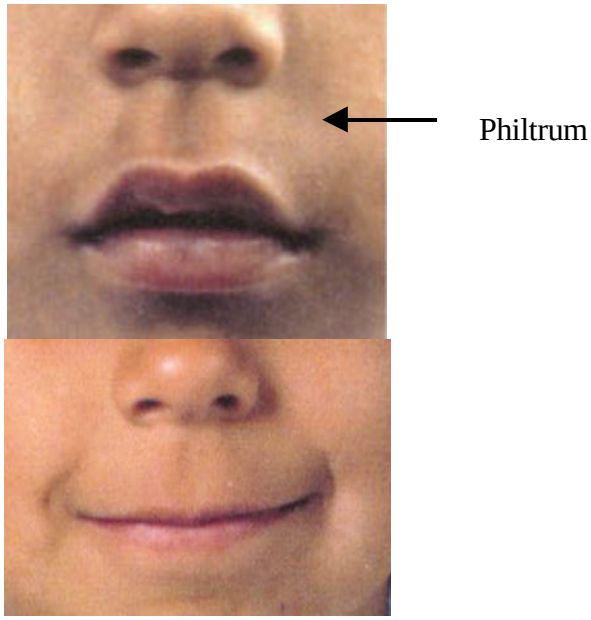


Figure 2. This is the same person with and without a smile. Note that without the smile, the lip and philtrum would both receive a correct Likert rank of # 1. With a smile[19], the lip and philtrum would both receive an incorrect Likert rank of # 5.

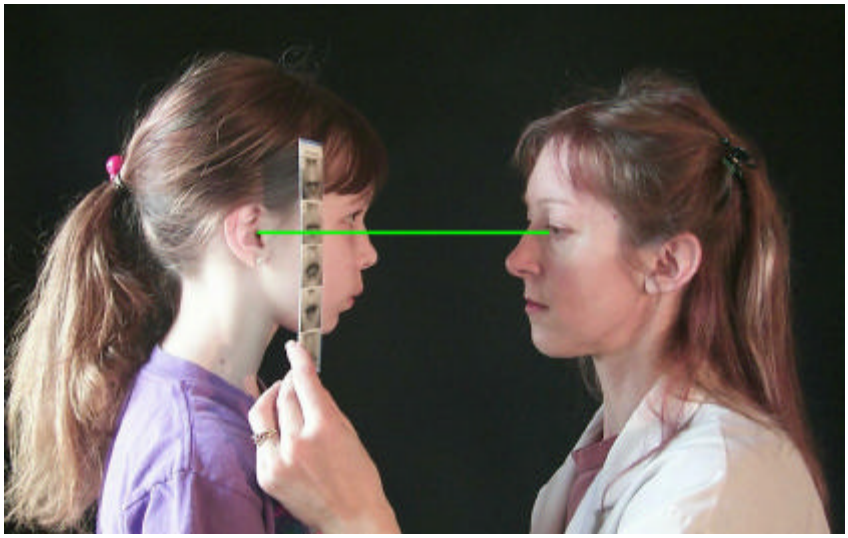


Figure 3. Illustration of a physician aligned in the patient's Frankfort Horizontal plane while using the Lip-Philtrum Guide to rank upper lip thinness and philtrum smoothness. The Frankfort Horizontal plane is defined by a line that passes through the patient's external auditory canal (marked by the tragion) and the lowest border of the bony orbital rim (orbitale). The physician's eyes (or camera lens) should be directly in line with this plane.

Example for Scoring Facial Phenotype

Patient measurements at 10 years of age:

- Palpebral fissure lengths = 2.5 cm which are < -2 SD's from the norm.
- Philtrum smoothness received a score of 5 on the 5-Point photographic Likert scale in Figure 1.
- Upper lip thinness received a score of 3 on the 5-Point photographic Likert scale in Figure 1.

Scoring

- The palpebral fissure lengths receive a Score of "C" in Table 3.

  A philtrum score of 5 corresponds to a score of "C" in Table 3.

  A lip score of 3 corresponds to a score of "B" in Table 3.

- The ABC-Score Combination for Fissure - Philtrum - Lip is **CCB**.

Table 3: Deriving the ABC-Score for Facial Phenotype

5-Point Likert Scale for Philtrum & Lip	Z-score for Largest Palpebral Fissure Length	Circle the ABC-Scores for: Palpebral Fissure	Smooth Philtrum	Thin Upper Lip
4 or 5	≤ -2 SD	**C**	**C**	C
3	>-2 SD and ≤ -1 SD	B	B	**B**
1 or 2	> -1 SD	A	A	A

- A score of CCB indicates that the level of expression of the FAS Facial Features is **MODERATE**.

- A MODERATE expression of the FAS facial features receives a rank of **3** in the 4-Digit Diagnostic Code.

Table 4: Converting the Facial ABC-Score to a 4-Digit Diagnostic Code Rank

4-Digit Diagnostic Code Rank	Level of Expression of FAS Facial Features	Palpebral Fissure - Philtrum - Lip ABC-Score Combinations
4	Severe	CCC
3	**Moderate**	**CCB**, CBC BCC
2	Mild	CCA, CAC, CBB, CBA, CAB, CAA, BCB, BCA, BBC, BAC ACC, ACB, ACA, ABC, AAC
1	Absent	BBB, BBA, BAB, BAA ABB, ABA, AAB, AAA

- Transfer the number **3** to the 4-Digit Diagnostic Code Grid on page 1 of the FAS Diagnostic Evaluation Form (duplicated below).

Result

4-Digit Diagnostic Code Grid

3 _____

significant	severe	definite	(4)					(4)	high risk
moderate	moderate	probable	(3)		X			(3)	some risk
mild	mild	possible	(2)					(2)	unknown
none	absent	unlikely	(1)					(1)	no risk
Growth Deficiency	**FAS Facial Features**	**Brain Dysfunction**		Growth	Face	Brain	Alcohol		**Gestational Alcohol**

III. Diagnostic Evaluation Form Instructions

B.3. Scoring Brain Function

Method for ranking the brain function component of the 4-Digit Diagnostic Code

A. Rank Definitions

Brain dysfunction is the most significant disability for individuals damaged by prenatal alcohol exposure. Accurately quantifying and qualifying it is important for both diagnosis and treatment planning. Brain damage can be defined in a large number of ways that are each associated with a broad spectrum of disability. The 4-point Brain Dysfunction Scale (Table 5) allows the clinician to differentiate patients with clear evidence of brain damage (static encephalopathy, Rank 4) from patients without evidence of brain damage (Rank 1). It also introduces two intermediate categories for describing patients who, in the clinician's judgment, cannot be classified as Rank 1 or 4. The higher the number the more *certain* the clinician is that the patient's cognitive and behavioral problems stem from brain damage, but a higher score does not necessarily mean a more severe expression of functional disability. Patients with severe brain dysfunction may not have good evidence for damage at the levels that we can currently study the brain. A patient could simultaneously meet the criteria for both a Rank 3 and 4 on this brain scale. When two scores are both applicable, the higher score is selected for diagnostic purposes because that reflects the level of certainty that there is brain damage.

Brain Rank 4

This rank is selected when the evidence for brain damage is defined through a traditional medical approach. It is our impression that "brain damage" or static encephalopathy is readily diagnosed by clinicians when structural anomalies of the brain are detected or when permanent neurologic findings of presumed prenatal origin are found. Evidence for brain damage includes microcephaly, structural abnormalities of the brain of presumed prenatal origin on a brain image (including, but not limited to hydrocephaly, heterotopias, agenesis of the corpus callosum, etc.), neurologic conditions like seizures which are not due to a postnatal insult or other process, other hard neurologic signs, or a full scale IQ of less than 60.

In this system, at this time, microcephaly is defined as a measurement that is ≤ 2 standard deviations from the mean. Head circumference ≤ 2 standard deviations from the mean has been associated with mental deficiency in the literature[20]. Microcephaly is measured independently of height and weight (i.e. children with height and weight that are less than the second centile and a head circumference of less than the second centile are considered to have the same degree of microcephaly as children who have greater somatic growth).

An IQ of 60 or less was selected for this rank because many experts regard mild mental retardation (IQ of 60-70) as potentially representing the low end of the normal range, while IQ's below 60 seem much more reliably related to true brain abnormality.

Ranking Criteria: One or more positive findings recorded under the Structural or Neurologic headings of the Brain Function section (page 3) of the FAS Diagnostic Evaluation Form are sufficient to classify a patient as Rank 4. A 'positive finding' is defined as a 'Severity of Outcome' score equal to 3.

Brain Rank 3

Through our experience with hundreds of patients who have been exposed to potentially teratogenic doses of ethanol, we have found that many would not qualify as having static encephalopathy using the definition above, but neither could the possibility that they have static encephalopathy be dismissed out of hand. These are typically patients with IQ scores that are above the range clearly indicative of mental retardation, but who often have wide variations in IQ subtest scores, and in addition, have problems with executive functioning, memory and learning, language pragmatics, social adaptation, attention, and/or activity level. These patients have problems that seem likely due to underlying brain structure or function rather than to adverse postnatal environmental experiences.

Ranking Criteria: Three or more significant deficiencies recorded under the Psychometric heading of the Brain Function section (pages 3 and 4) of the FAS Diagnostic Evaluation Form are sufficient to classify a patient as Rank 3. A 'significant deficiency' is defined as a 'Severity of Outcome' score equal to 3.

Brain Rank 2

This score should be given to two groups of patients. All patients in Rank 2 should have histories of behavioral and/or cognitive problems that strongly suggest underlying brain dysfunction. One group of patients has not yet had the types of testing that would move them into Ranks 3 or 4 if positive. The reason for this lack of testing is usually because the patients are too young to be tested (i.e., less than 6 years of age). The other group of patients is those who have had testing that did not reveal compelling evidence for Rank 3 or 4 classification, and yet, in the clinician's judgment, a strong possibility of brain damage can not be wholly dismissed. Alternative testing and/or follow-up testing should usually be considered. If adequately sensitive and appropriate testing has been carried out without clear evidence of brain dysfunction, it is unlikely a Rank 2 classification would be given.

Ranking Criteria: Deficiencies recorded under the Caregiver Interview heading of the Brain Function section (page 5) of the FAS Diagnostic Evaluation Form serve to support a Rank 2 classification. To date, criteria for the number of deficiencies that must be present to warrant a Rank 2 classification have not been established. The classification is made through clinical judgment and the overall weight of evidence obtained.

Brain Rank 1

Patients are classified as Rank 1 when no structural, neurologic or cognitive/behavioral problems measured by psychometric assessment or caregiver interview are discerned.

B. Completing the Brain Function section of the FAS Diagnostic Evaluation Form

The Brain Function section appears on pages 3 through 5 of the FAS Diagnostic Evaluation Form. These pages serve as a place to record pertinent structural, neurologic, pyschometric and caregiver interview data available on the patient. Although space has been provided to record a full complement of assessments, we are not implying that all of these assessments must be conducted to derive a diagnosis. It is the responsibility of the clinical team to select the most appropriate assessment battery. Recording data for the structural, neurologic and psychometric sections is self explanatory. The Caregiver Interview section warrants further explanation.

An important aspect of the FAS evaluation is an in depth interview of the caregivers of the patient. This interview takes approximately one hour and is conducted jointly by the physician and psychologist while the child is being formally assessed by the other clinical staff members. There are several questions that need to be addressed. What are the problems that led to the diagnostic referral? What do the caregivers hope to gain from the assessment? What are the caregivers' views of the patient's overall strengths and weaknesses? What is the child's social and medical history? In addition, we have found it very useful to methodically ask age-appropriate questions that review the patient's functional abilities in domains that are commonly problematic for alcohol exposed individuals according to the literature. These domains (planning, behavioral regulation/sensory motor integration, abstract thinking/judgment, memory/learning/information processing, spatial memory, social skills/adaptive behavior and motor control) are presented on the FAS Diagnostic Evaluation Form (page 5). Routinely asking these questions serves several purposes. First, the caregivers' ability to answer the questions gives insight into their capability of interpreting the patient's behaviors and their general relationship with the patient. Second, it is often helpful to compare this subjective assessment to the psychometric profile to see if discrepancies or deficiencies are present. Third, abnormalities in these domains serve to differentiate Brain Rank 2 from Brain Rank 1. That is, the data needed to establish a Rank 3 or 4 classification is not found, but the reported behaviors of the patient cannot be dismissed as normal variants or transient emotional responses to environmental problems (i.e., depression, post traumatic stress, etc.).

Severity of Outcome Scale [0, 1, 2, 3]

Along the left margin of each page is a Severity of Outcome scale. The clinician is asked to rank the level of abnormality of each outcome as follows: 0 = unable to judge, 1 = normal, 2 = mildly abnormal and 3 = severely abnormal. This ranking process is based on the clinician's clinical judgment and serves to guide him/her in ranking brain dysfunction. For outcomes measured on standardized scales, outcomes ≥ 2 S.D.'s from the norm would be judged severely abnormal.

Table 5: Deriving the 4-Digit Diagnostic Code Rank for Brain Function

4-Digit Diagnostic Code Rank*	Brain Dysfunction Scale	Confirmatory Findings
4	**Definite** *referred to as static encephalopathy*	● Microcephaly, OFC ≤ -2 S. D. *and / or* ● Abnormalities on brain images diagnostic of prenatal alteration *and / or* ● Evidence of persistent neurologic findings likely to be of prenatal origin *and / or* ● I. Q. score ≤ 60
3	**Probable** *referred to as static encephalopathy*	● Substantial deficiencies or discrepancies across multiple areas of brain performance such as cognition, achievement, adaptation, neurologic "soft" signs, and language. Generally three or more areas should be found aberrant.
2	**Possible** *referred to as neurobehavioral disorder*	● Historical information / personal observations strongly suggest the possibility of brain damage, but data to this point does not permit a Rank 3 or 4 classification.
1	**Absent**	● No problems likely to reflect brain damage are presented.

* Transfer the resulting 4-Digit Diagnostic Code Rank for Brain Function to the 4-Digit Diagnostic Code Grid on page 1 of the FAS Diagnostic Evaluation Form.

III. Diagnostic Evaluation Form Instructions

B.4. Scoring Alcohol Exposure

Table 6: Deriving the 4-Digit Diagnostic Code Rank for Alcohol Exposure

4-Digit Diagnostic Code Rank*	Gestational Alcohol Exposure Category	Description
4	High Risk	● Alcohol use during pregnancy CONFIRMED *and* ● Exposure pattern is consistent with the medical literature placing the fetus at "high risk" (generally high peak blood alcohol concentrations delivered at least weekly in early pregnancy).
3	Some Risk	● Alcohol use during pregnancy CONFIRMED *and* ● Drinking occurred in gestation in frequencies and volumes less than in Rank (4) or exact amounts unknown.
2	Unknown Risk	● Gestational exposure is simply not known or information is of questionable reliability
1	No Risk	● Alcohol use during pregnancy is CONFIRMED to be completely ABSENT.

* Transfer the resulting 4-Digit Diagnostic Code Rank for Alcohol Exposure to the 4-Digit Diagnostic Code Grid on page 1 of the FAS Diagnostic Evaluation Form.

III. Diagnostic Evaluation Form Instructions

B.5. Scoring Co-Morbidities

The co-morbidity scales are added for clinical clarification. It is rare that other pre- and/or postnatal factors have not played a role in creating the specific disabilities in a patient with prenatal alcohol exposure. These factors are often helpful in explaining the specific problems faced by the patient and helpful in development of a treatment plan.

A. Prenatal Co-Morbidity Rank Definitions

High Risk (Likert Rank 4):
This Rank is reserved for alternate genetic conditions (e.g., Fragile X, Noonans syndrome, velocardiofacial syndrome, etc.) or teratogenic exposures (e.g., hydantoin, etc.) that have been clearly shown to produce abnormalities.

Some Risk (Likert Rank 3):
This category is used for potential genetic conditions, teratogenic exposures or prenatal conditions that have been associated with physical or neurodevelopmental problems in a less well-established way. Examples of conditions that would be placed in this category would include poor prenatal care; patients whose parents have mild mental retardation, attention deficit, significant learning disabilities or learning problems thought to be due to a non-specific (and non-teratogenic) source; exposure to drugs like marijuana or heroin, in otherwise non-specified frequencies and quantities; and cigarette smoking.

Unknown Risk (Likert Rank 2):
This category is used when the details of the family background and gestation are unknown – generally in the circumstance of a closed adoption.

No Risk (Likert Rank 1):
On occasion, the genetic, teratogenic, and prenatal histories are well documented and no factors can be identified that would explain the abnormalities found in the patient.

B. Postnatal Co-Morbidity Rank Definitions

High Risk (Likert Rank 4):
This Rank is used to note postnatal circumstances that have been shown to have a significant adverse effect on development in most instances. Examples would include physical and sexual abuse, multiple disrupted placements, neglect resulting in failure to thrive, serious head injury, or medical conditions which lead to brain damage (i.e. kernicterus or persistent neonatal apnea).

Some Risk (Likert Rank 3):
This Rank is used to note conditions akin to those in Rank 4, but the circumstances are less severe and so less likely to be a definite factor in the patient's present condition. Obviously, clinical judgment is needed in judging the magnitude of a postnatal problem and interpreting this information into a Rank 3 or 4 placement.

Unknown Risk (Likert Rank 2):
This Rank is used when historical information is missing. This is sometimes the case with adopted children or those in foster care. Adult patients may, at times, be unable to reconstruct their own early histories.

No Risk (Likert Rank 1):
This Rank is used when a well documented history confirms an absence of adverse postnatal events.

IV. Diagnostic Categories

The 256 Diagnostic Codes can be logically grouped into 22 Diagnostic Categories

Category	Name
A	Fetal alcohol syndrome (alcohol exposed)
B	Fetal alcohol syndrome (alcohol exposure unknown)
C	Atypical fetal alcohol syndrome (alcohol exposed)
D	Fetal alcohol syndrome phenocopy (no alcohol exposure)
E	Sentinel physical findings / static encephalopathy (alcohol exposed)
F	Static encephalopathy (alcohol exposed)
G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
H	Neurobehavioral disorder (alcohol exposed)
I	Sentinel physical findings (alcohol exposed)
J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
L	Static encephalopathy (alcohol exposure unknown)
M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
N	Neurobehavioral disorder (alcohol exposure unknown)
O	Sentinel physical findings (alcohol exposure unknown)
P	No cognitive/behavioral or sentinel physical findings detected (alcohol exposure unknown)
Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
R	Static encephalopathy (no alcohol exposure)
S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
T	Neurobehavioral disorder (no alcohol exposure)
U	Sentinel physical findings (no alcohol exposure)
V	No cognitive/behavioral or sentinel physical findings detected (no alcohol exposure)

V. 4-Digit Diagnostic Codes Within each Diagnostic Category

Category	Diagnostic Name and Codes
A	Fetal alcohol syndrome (alcohol exposed) 3433 4433 3434 4434 3443 4443 3444 4444
B	Fetal alcohol syndrome (alcohol exposure unknown) 3432 4432 3442 4442
C	Atypical fetal alcohol syndrome (alcohol exposed) 1443 1434 2434 3334 4334 4343 2443 1444 2444 3344 4344
D	Fetal alcohol syndrome phenocopy (no alcohol exposure) 3431 4341 4441 3441 4431
E	Sentinel physical findings / static encephalopathy (alcohol exposed) 1333 1433 2344 3143 3243 4133 4233 4333 1334 2333 2433 3144 3244 4134 4234 1343 2334 3133 3233 3333 4143 4243 1344 2343 3134 3234 3343 4144 4244
F	Static encephalopathy (alcohol exposed) 1133 1144 1243 2134 2233 2244 1134 1233 1244 2143 2234 1143 1234 2133 2144 2243
G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed) 1323 2323 3123 3323 4123 4323 1324 2324 3124 3324 4124 4324 1423 2423 3223 3423 4223 4423 1424 2424 3224 3424 4224 4424

Category	Diagnostic Name and Codes
H	Neurobehavioral disorder (alcohol exposed) 1123 2123 1124 2124 1223 2223 1224 2224
I	Sentinel physical findings (alcohol exposed) 1313 2313 3113 3313 4113 4313 1314 2314 3114 3314 4114 4314 1413 2413 3213 3413 4213 4413 1414 2414 3214 3414 4214 4414
J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed) 1113 2113 1114 2114 1213 2213 1214 2214
K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown) 1332 2332 3132 3332 4232 1342 2342 3142 3342 4242 1432 2432 3232 4132 4332 1442 2442 3242 4142 4342
L	Static encephalopathy (alcohol exposure unknown) 1132 1232 2132 2232 1142 1242 2142 2242
M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown) 1322 2322 3122 3322 4122 4322 1422 2422 3222 3422 4222 4422
N	Neurobehavioral disorder (alcohol exposure unknown) 1122 1222 2122 2222
O	Sentinel physical findings (alcohol exposure unknown) 1312 2312 3112 3312 4112 4312 1412 2412 3212 3412 4212 4412

Category	Diagnostic Name and Codes
P	No cogn./behavioral or sentinel physical findings detected (alcohol exposure unknown) 1112 2112 1212 2212
Q	Sentinel physical findings / static encephalopathy (no alcohol exposure) 1331 2341 3231 4141 1341 2431 3241 4231 1431 2441 3331 4241 1441 3131 3341 4331 2331 3141 4131
R	Static encephalopathy (no alcohol exposure) 1131 2131 1141 2141 1231 2231 1241 2241
S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure) 1321 3121 4121 1421 3221 4221 2321 3321 4321 2421 3421 4421
T	Neurobehavioral disorder (no alcohol exposure) 1121 2121 2221 1221
U	Sentinel physical findings (no alcohol exposure) 1311 3111 4111 1411 3211 4211 2311 3311 4311 2411 3411 4411
V	No cognitive/behavioral or sentinel physical findings detected (no alcohol exposure) 1111 2111 1211 2211

VI. 4-Digit Diagnostic Codes Sorted Numerically

Code	Category	Diagnostic Name
1111	V	No cognitive/behavioral or sentinel physical findings detected (no alcohol exposure)
1112	P	No cognitive/behavioral or sentinel physical findings detected (alcohol exposure unknown)
1113	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
1114	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
1121	T	Neurobehavioral disorder (no alcohol exposure)
1122	N	Neurobehavioral disorder (alcohol exposure unknown)
1123	H	Neurobehavioral disorder (alcohol exposed)
1124	H	Neurobehavioral disorder (alcohol exposed)
1131	R	Static encephalopathy (no alcohol exposure)
1132	L	Static encephalopathy (alcohol exposure unknown)
1133	F	Static encephalopathy (alcohol exposed)
1134	F	Static encephalopathy (alcohol exposed)
1141	R	Static encephalopathy (no alcohol exposure)
1142	L	Static encephalopathy (alcohol exposure unknown)
1143	F	Static encephalopathy (alcohol exposed)
1144	F	Static encephalopathy (alcohol exposed)
1211	V	No cognitive/behavioral or sentinel physical findings detected (no alcohol exposure)
1212	P	No cognitive/behavioral or sentinel physical findings detected (alcohol exposure unknown)
1213	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
1214	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
1221	T	Neurobehavioral disorder (no alcohol exposure)
1222	N	Neurobehavioral disorder (alcohol exposure unknown)
1223	H	Neurobehavioral disorder (alcohol exposed)
1224	H	Neurobehavioral disorder (alcohol exposed)
1231	R	Static encephalopathy (no alcohol exposure)
1232	L	Static encephalopathy (alcohol exposure unknown)
1233	F	Static encephalopathy (alcohol exposed)
1234	F	Static encephalopathy (alcohol exposed)
1241	R	Static encephalopathy (no alcohol exposure)
1242	L	Static encephalopathy (alcohol exposure unknown)
1243	F	Static encephalopathy (alcohol exposed)
1244	F	Static encephalopathy (alcohol exposed)
1311	U	Sentinel physical findings (no alcohol exposure)
1312	O	Sentinel physical findings (alcohol exposure unknown)
1313	I	Sentinel physical findings (alcohol exposed)
1314	I	Sentinel physical findings (alcohol exposed)
1321	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
1322	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
1323	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)

Code	Category	Diagnostic Name
1324	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
1331	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
1332	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
1333	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
1334	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
1341	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
1342	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
1343	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
1344	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
1411	U	Sentinel physical findings (no alcohol exposure)
1412	O	Sentinel physical findings (alcohol exposure unknown)
1413	I	Sentinel physical findings (alcohol exposed)
1414	I	Sentinel physical findings (alcohol exposed)
1421	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
1422	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
1423	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
1424	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
1431	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
1432	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
1433	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
1434	C	Atypical fetal alcohol syndrome (alcohol exposed)
1441	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
1442	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
1443	C	Atypical fetal alcohol syndrome (alcohol exposed)
1444	C	Atypical fetal alcohol syndrome (alcohol exposed)
2111	V	No cognitive/behavioral or sentinel physical findings detected (no alcohol exposure)
2112	P	No cognitive/behavioral or sentinel physical findings detected (alcohol exposure unknown)
2113	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
2114	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
2121	T	Neurobehavioral disorder (no alcohol exposure)
2122	N	Neurobehavioral disorder (alcohol exposure unknown)
2123	H	Neurobehavioral disorder (alcohol exposed)
2124	H	Neurobehavioral disorder (alcohol exposed)
2131	R	Static encephalopathy (no alcohol exposure)
2132	L	Static encephalopathy (alcohol exposure unknown)
2133	F	Static encephalopathy (alcohol exposed)
2134	F	Static encephalopathy (alcohol exposed)
2141	R	Static encephalopathy (no alcohol exposure)
2142	L	Static encephalopathy (alcohol exposure unknown)
2143	F	Static encephalopathy (alcohol exposed)
2144	F	Static encephalopathy (alcohol exposed)
2211	V	No cognitive/behavioral or sentinel physical findings detected (no alcohol exposure)
2212	P	No cognitive/behavioral or sentinel physical findings detected (alcohol exposure unknown)
2213	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)

Code	Category	Diagnostic Name
2214	J	No cognitive/behavioral or sentinel physical findings detected (alcohol exposed)
2221	T	Neurobehavioral disorder (no alcohol exposure)
2222	N	Neurobehavioral disorder (alcohol exposure unknown)
2223	H	Neurobehavioral disorder (alcohol exposed)
2224	H	Neurobehavioral disorder (alcohol exposed)
2231	R	Static encephalopathy (no alcohol exposure)
2232	L	Static encephalopathy (alcohol exposure unknown)
2233	F	Static encephalopathy (alcohol exposed)
2234	F	Static encephalopathy (alcohol exposed)
2241	R	Static encephalopathy (no alcohol exposure)
2242	L	Static encephalopathy (alcohol exposure unknown)
2243	F	Static encephalopathy (alcohol exposed)
2244	F	Static encephalopathy (alcohol exposed)
2311	U	Sentinel physical findings (no alcohol exposure)
2312	O	Sentinel physical findings (alcohol exposure unknown)
2313	I	Sentinel physical findings (alcohol exposed)
2314	I	Sentinel physical findings (alcohol exposed)
2321	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
2322	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
2323	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
2324	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
2331	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
2332	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
2333	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
2334	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
2341	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
2342	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
2343	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
2344	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
2411	U	Sentinel physical findings (no alcohol exposure)
2412	O	Sentinel physical findings (alcohol exposure unknown)
2413	I	Sentinel physical findings (alcohol exposed)
2414	I	Sentinel physical findings (alcohol exposed)
2421	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
2422	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
2423	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
2424	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
2431	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
2432	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
2433	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
2434	C	Atypical fetal alcohol syndrome (alcohol exposed)
2441	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
2442	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
2443	C	Atypical fetal alcohol syndrome (alcohol exposed)

Code	Category	Diagnostic Name
2444	C	Atypical fetal alcohol syndrome (alcohol exposed)
3111	U	Sentinel physical findings (no alcohol exposure)
3112	O	Sentinel physical findings (alcohol exposure unknown)
3113	I	Sentinel physical findings (alcohol exposed)
3114	I	Sentinel physical findings (alcohol exposed)
3121	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
3122	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
3123	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3124	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3131	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
3132	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
3133	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3134	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3141	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
3142	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
3143	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3144	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3211	U	Sentinel physical findings (no alcohol exposure)
3212	O	Sentinel physical findings (alcohol exposure unknown)
3213	I	Sentinel physical findings (alcohol exposed)
3214	I	Sentinel physical findings (alcohol exposed)
3221	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
3222	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
3223	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3224	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3231	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
3232	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
3233	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3234	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3241	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
3242	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
3243	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3244	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3311	U	Sentinel physical findings (no alcohol exposure)
3312	O	Sentinel physical findings (alcohol exposure unknown)
3313	I	Sentinel physical findings (alcohol exposed)
3314	I	Sentinel physical findings (alcohol exposed)
3321	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
3322	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
3323	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3324	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3331	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
3332	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
3333	E	Sentinel physical findings / static encephalopathy (alcohol exposed)

Code	Category	Diagnostic Name
3334	C	Atypical fetal alcohol syndrome (alcohol exposed)
3341	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
3342	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
3343	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
3344	C	Atypical fetal alcohol syndrome (alcohol exposed)
3411	U	Sentinel physical findings (no alcohol exposure)
3412	O	Sentinel physical findings (alcohol exposure unknown)
3413	I	Sentinel physical findings (alcohol exposed)
3414	I	Sentinel physical findings (alcohol exposed)
3421	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
3422	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
3423	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3424	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
3431	D	Fetal alcohol syndrome phenocopy (no alcohol exposure)
3432	B	Fetal alcohol syndrome (alcohol exposure unknown)
3433	A	Fetal alcohol syndrome (alcohol exposed)
3434	A	Fetal alcohol syndrome (alcohol exposed)
3441	D	Fetal alcohol syndrome phenocopy (no alcohol exposure)
3442	B	Fetal alcohol syndrome (alcohol exposure unknown)
3443	A	Fetal alcohol syndrome (alcohol exposed)
3444	A	Fetal alcohol syndrome (alcohol exposed)
4111	U	Sentinel physical findings (no alcohol exposure)
4112	O	Sentinel physical findings (alcohol exposure unknown)
4113	I	Sentinel physical findings (alcohol exposed)
4114	I	Sentinel physical findings (alcohol exposed)
4121	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
4122	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
4123	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4124	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4131	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
4132	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
4133	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4134	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4141	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
4142	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
4143	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4144	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4211	U	Sentinel physical findings (no alcohol exposure)
4212	O	Sentinel physical findings (alcohol exposure unknown)
4213	I	Sentinel physical findings (alcohol exposed)
4214	I	Sentinel physical findings (alcohol exposed)
4221	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
4222	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
4223	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4224	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)

Code	Category	Diagnostic Name
4231	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
4232	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
4233	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4234	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4241	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
4242	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
4243	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4244	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4311	U	Sentinel physical findings (no alcohol exposure)
4312	O	Sentinel physical findings (alcohol exposure unknown)
4313	I	Sentinel physical findings (alcohol exposed)
4314	I	Sentinel physical findings (alcohol exposed)
4321	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
4322	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
4323	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4324	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4331	Q	Sentinel physical findings / static encephalopathy (no alcohol exposure)
4332	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
4333	E	Sentinel physical findings / static encephalopathy (alcohol exposed)
4334	C	Atypical fetal alcohol syndrome (alcohol exposed)
4341	D	Fetal alcohol syndrome phenocopy (no alcohol exposure)
4342	K	Sentinel physical findings / static encephalopathy (alcohol exposure unknown)
4343	C	Atypical fetal alcohol syndrome (alcohol exposed)
4344	C	Atypical fetal alcohol syndrome (alcohol exposed)
4411	U	Sentinel physical findings (no alcohol exposure)
4412	O	Sentinel physical findings (alcohol exposure unknown)
4413	I	Sentinel physical findings (alcohol exposed)
4414	I	Sentinel physical findings (alcohol exposed)
4421	S	Sentinel physical findings / neurobehavioral disorder (no alcohol exposure)
4422	M	Sentinel physical findings / neurobehavioral disorder (alcohol exposure unknown)
4423	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4424	G	Sentinel physical findings / neurobehavioral disorder (alcohol exposed)
4431	D	Fetal alcohol syndrome phenocopy (no alcohol exposure)
4432	B	Fetal alcohol syndrome (alcohol exposure unknown)
4433	A	Fetal alcohol syndrome (alcohol exposed)
4434	A	Fetal alcohol syndrome (alcohol exposed)
4441	D	Fetal alcohol syndrome phenocopy (no alcohol exposure)
4442	B	Fetal alcohol syndrome (alcohol exposure unknown)
4443	A	Fetal alcohol syndrome (alcohol exposed)
4444	A	Fetal alcohol syndrome (alcohol exposed)

VII. Clinical Summaries
For each of the 22 Diagnostic Categories

Clinical summaries for each of the 22 Diagnostic Categories are presented on the following pages listed alphabetically from A through V. A complete list of the 22 categories is presented in Section IV.

These summaries can be used as the first page of the final diagnostic report. They often require minor alterations or additions to conform to the specifics of an individual case.

A

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Fetal Alcohol Syndrome**
(2) Alcohol exposed

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies, and evidence of brain damage which occur in individuals exposed to alcohol during gestation. On the attached sheets are the specific findings in this patient's case that led to our conclusion that there was sufficient evidence to make the diagnosis of fetal alcohol syndrome.

Although we believe that the patient clearly has fetal alcohol syndrome, this does not mean that alcohol exposure during pregnancy is the only cause of the patient's current problems. A number of other factors could be contributing to the present situation, such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. Such factors may partly explain why there is so much variability in the kinds of specific difficulties that patients with FAS have.

Individuals with FAS have brain damage as a major component of their cognitive and behavioral problems and should be viewed individuals with disabilities. The fetal alcohol syndrome diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific concerns that have been identified that need attention.

_____ _____

Physician's Signature Date

B

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Fetal Alcohol Syndrome**
(2) Alcohol exposure unknown

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. On the attached sheets are the specific findings in this patient's case which led to our conclusion that there was sufficient evidence in this case to make a diagnosis of fetal alcohol syndrome even though the history of exposure to alcohol during gestation could not be confirmed.

Although we believe that the patient clearly has fetal alcohol syndrome, this does not mean that alcohol exposure during pregnancy is the only cause of the patient's current problems. A number of other factors could be contributing to the present issues, such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. Such factors may partly explain why there is so much variability in the kinds of specific difficulties that patients with FAS have.

Individuals with FAS have brain damage as a major component of their cognitive and behavioral problems and should be viewed individuals with disabilities. The fetal alcohol syndrome diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific concerns that have been identified that need attention.

_____ _____

Physician's Signature Date

C

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Atypical Fetal Alcohol Syndrome**
(2) Alcohol exposed

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS. Indeed, many patients who have been exposed to alcohol show most, but not all, of the classic features of this syndrome. We use the term "atypical fetal alcohol syndrome" when a patient's characteristic features are very close to the classic features of FAS and the alcohol history strongly suggests that alcohol exposure during gestation was at high risk and likely to have played a role in the syndrome. Patients with atypical FAS either have the full set of facial anomalies found with FAS and evidence of brain damage, but do not have growth deficiency; or they have growth deficiency and evidence of brain damage, and most but not all of the FAS facial features. As you can see from the enclosed list of features found in this patient, the patient meets the criteria for atypical FAS. Patients diagnosed with atypical FAS must have confirmed exposure to high levels of alcohol during gestation.

In addition to gestational exposure to alcohol, a number of other factors could be contributing to the patient's current problems, such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. Such factors may partly explain why there is so much variability in the kinds of specific difficulties that patients with FAS experience.

Patients with atypical FAS have brain damage as a major component of their cognitive and behavioral problems and should be viewed as having a disability. The diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific concerns that have been identified that need attention.

_____ _____

Physician's Signature Date

D

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Fetal Alcohol Syndrome Phenocopy**
(2) No alcohol exposure

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. On the attached sheets are the specific findings in this patient's case that led to our conclusion that the patient has all of the features of FAS. However, there is good reason to believe this patient was not exposed to alcohol during gestation.

Most syndromes can occasionally arise from an alternate cause. Presumably, this is the situation here. A number of other factors could be contributing to the present situation, such as the patient's genetic background and other potential exposures or problems during pregnancy, and various experiences since birth.

Whatever the cause of this patient's syndrome, there is brain damage which is a major component of their cognitive and behavioral problems and the patient should be viewed as a person with a disability. The syndrome diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific concerns that have been identified that need attention.

_____ _____
Physician's Signature Date

E

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis:
(1) Static encephalopathy
(2) Sentinel physical findings
(3) Alcohol exposed

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of facial characteristics, and evidence of brain damage in individuals exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

In this patient's case, some but not all of the characteristic growth and facial features associated with FAS were present and there was evidence of brain damage as you will see noted on the attached pages. There was also a clear history of exposure to significant amounts of alcohol during gestation. In this situation, we use the terms "static encephalopathy" and "sentinel physical findings" to describe the patient's condition. Static encephalopathy literally means non-progressive brain dysfunction. The diagnoses of "static encephalopathy and sentinel physical findings" in the presence of alcohol exposure do not mean that alcohol is the only cause of the problem. A number of other factors could be contributing to the present issues such as the patient's genetic background, other potential exposures or problems during gestation, and various experiences since birth. These kinds of differences may partly explain why there is so much variability in the kinds of specific difficulties that patients with static encephalopathy and alcohol exposure have.

The diagnoses made today are based on the information available at the time of this assessment. If this patient's alcohol exposure was considered "low risk" and new information is uncovered which documents higher exposures; or if the patient's facial features, growth, or neurobehavioral problems were judged "probable" and further growth or development suggest a "definite" problem is present, then reconsideration of the diagnosis of fetal alcohol syndrome would be appropriate. Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

Individuals with static encephalopathy have brain damage which is a major component of their cognitive and behavioral problems and they should be viewed as individuals with disabilities. The static encephalopathy diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____
Physician's Signature Date

F

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Static Encephalopathy**
(2) Alcohol exposed

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

In this patient's case, no growth deficiency or characteristic set of facial features were found so the patient does not have FAS, but there was evidence of brain damage as you will see noted on the attached pages. There was also a clear history of exposure to significant amounts of alcohol during gestation. In this situation, we use the term "static encephalopathy" to describe the patient's condition. Static encephalopathy literally means non-progressive brain dysfunction. On the attached sheets are the specific findings in this patient's case that led us to this conclusion. The diagnosis of static encephalopathy does not mean that alcohol is the only cause of the problem. A number of other factors could be contributing to the present issues such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. These kinds of differences may partly explain why there is so much variability in the kinds of specific difficulties that patients with static encephalopathy face.

Individuals with static encephalopathy have brain damage that is a major component of their cognitive and behavioral problems and they should be viewed as individuals with disabilities. The static encephalopathy diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

G

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Neurobehavioral disorder**
(2) Sentinel physical findings
(3) Alcohol exposed

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS. On the attached sheets you will find our specific observations in this case. We found that some, but not all, of the characteristic physical findings seen in patients with FAS were present. There was not strong evidence that the patient's cognitive/behavioral problems were clearly due to brain damage, but there were suggestions that this was the case. In this situation we use the term "neurobehavioral disorder" to emphasize the possibility that the problems may not be entirely due to postnatal experiences. Certainly a number of other factors could be contributing to the patient's condition such as genetic background, other potential exposures or problems during pregnancy, and various experiences since birth.

The diagnoses made today are based on the information at hand. If further testing is done which makes the likelihood of brain damage of prenatal cause more likely, then an alternate diagnosis could be considered. Alternately other birth defect syndromes not related to alcohol exposure may also need consideration.

In any event, the diagnosis of neurobehavioral disorder means that issues of abnormal brain structure and brain impairment need to be considered with implications for educational planning, societal expectations, and health. On the attached sheet, you will find a list of specific problems that have been identified that need attention.

_____ _____
Physician's Signature Date

H

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Neurobehavioral disorder**
(2) Alcohol exposed

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of facial characteristics, and evidence of brain damage in individuals exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

On the attached sheets you will find our specific observations in this case. There was not strong evidence that the patient's cognitive/behavioral problems were clearly due to brain damage, but there were suggestions that this was the case. In this situation we use the term "neurobehavioral disorder" to emphasize the possibility that the problems may not be entirely due to postnatal experiences. Certainly a number of other factors could be contributing to the patient's condition such as genetic background, other potential exposures or problems during gestation, and various experiences since birth.

The diagnosis made today is based on the information available at the time of this assessment. If this patient's alcohol exposure was considered "low risk" and new information is uncovered which documents higher exposure, or if the patient's facial features or growth become more abnormal or if further testing finds further evidence of brain damage, then further diagnostic consideration would be appropriate.

Whatever the cause, the diagnosis of neurobehavioral disorder means that issues of abnormal brain structure and brain impairment need to be considered with implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

I

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Sentinel physical findings**
(2) Alcohol exposed

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS. Some individuals have the growth deficiency and/or facial characteristics, but do not have evidence of brain damage. We refer to this condition as "Sentinel physical findings / Alcohol exposed". On the attached sheets are the specific findings in this patient's case which indicate that the characteristic growth deficiencies and/or facial features are, to some extent, compatible with FAS, but at this time there is no clear evidence of cognitive or behavioral problems that strongly suggest brain damage. At such time in the future that brain damage is found through images of the brain, neurologic testing or cognitive behavioral assessment, then the diagnosis of fetal alcohol syndrome should be reconsidered. Other birth defect syndromes that are not related to alcohol exposure should also be considered as alternate explanations for the patient's problems.

_____ _____
Physician's Signature Date

J

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis **(1) No cognitive/behavioral or sentinel physical findings detected**
(2) Alcohol exposed

In this current assessment, we conclude that this patient was exposed to alcohol during gestation, but no specific cognitive, behavioral, or characteristic physical findings were detected in our examination.

No alcohol related diagnoses are offered at this time. Re-evaluation would be appropriate in the future if problems arise that strongly suggested brain damage, growth deficiency, or facial dysmorphology.

_____ _____

Physician's Signature Date

K

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis
(1) Static encephalopathy
(2) Sentinel physical findings
(3) Alcohol exposure unknown

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of facial characteristics, and evidence of brain damage in individuals exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

In this patient's case, some but not all of the characteristic growth and facial features associated with FAS were present and there was evidence of brain damage as you will see noted on the attached pages. In this situation, we use the terms "static encephalopathy" and "sentinel physical findings" to describe the patient's condition. Static encephalopathy literally means non-progressive brain dysfunction. Although it is unknown whether this patient was exposed to alcohol during gestation, a number of other factors could be contributing to the patient's current cognitive/behavioral problems such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. These kinds of differences may partly explain why there is so much variability in the kinds of specific difficulties that patients with static encephalopathy have.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal, then further diagnostic consideration would be appropriate. Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

Individuals with static encephalopathy have brain damage which is a major component of their cognitive and behavioral problems and they should be viewed as a person with a disability. The static encephalopathy diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

L

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Static encephalopathy**
(2) Alcohol exposure unknown

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

In this patient's case, no growth deficiency or characteristic set of facial features were found so the patient does not have FAS, but there was evidence of brain damage as you will see noted on the attached pages. In this situation, we use the term "static encephalopathy" to describe the patient's condition. Static encephalopathy literally means non-progressive brain dysfunction. On the attached sheets are the specific findings in this patient's case that led us to this conclusion. Although it is unknown whether this patient was exposed to alcohol during gestation, a number of other factors could be contributing to the patient's current cognitive/behavioral problems such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. These kinds of differences may partly explain why there is so much variability in the kinds of specific difficulties that patients with static encephalopathy face.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal, then further diagnostic consideration would be appropriate.

Individuals with static encephalopathy have brain damage that is a major component of their cognitive and behavioral problems and they should be viewed as individuals with disabilities. The static encephalopathy diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____
Physician's Signature Date

M

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis:
(1) Neurobehavioral disorder
(2) Sentinel physical findings
(3) Alcohol exposure unknown

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS. On the attached sheets you will find our specific observations in this case. We found that some, but not all, of the characteristic physical findings seen in patients with FAS were present and a confirmed history of alcohol exposure during gestation was not available. There was not strong evidence that the patient's cognitive/behavioral problems were clearly due to brain damage, but there were suggestions that this was the case. In this situation we use the term "neurobehavioral disorder" to emphasize the possibility that the problems may not be entirely due to postnatal experiences. Certainly a number of other factors could be contributing to the patient's condition such as genetic background, other potential exposures or problems during pregnancy, and various experiences since birth.

The diagnoses made today are based on the information at hand. If further testing is done which makes the likelihood of brain damage of prenatal cause more likely, then an alternate diagnosis would be considered. . Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

In any event, the diagnosis of neurobehavioral disorder means that issues of abnormal brain structure and brain impairment need to be considered with implications for educational planning, societal expectations, and health. On the attached sheet, you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

N

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Neurobehavioral disorder**
(2) Alcohol exposure unknown

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of facial characteristics, and evidence of brain damage in individuals exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

On the attached sheets you will find our specific observations in this case. There was not strong evidence that the patient's cognitive/behavioral problems were clearly due to brain damage, but there were suggestions that this was the case. In this situation we use the term "neurobehavioral disorder" to emphasize the possibility that the problems may not be entirely due to postnatal experiences. Certainly a number of other factors could be contributing to the patient's condition such as genetic background, other potential exposures or problems during gestation, and various experiences since birth.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal or if further testing finds further evidence of brain damage, then further diagnostic consideration would be appropriate.

Whatever the cause, the diagnosis of neurobehavioral disorder means that issues of abnormal brain structure and brain impairment need to be considered with implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

O

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Sentinel physical findings**
(2) Alcohol exposure unknown

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation. Not all individuals exposed to alcohol during gestation have FAS.

Some individuals have the growth deficiency and/or facial characteristics, but do not have evidence of brain damage. We refer to this condition as "Sentinel physical findings". On the attached sheets are the specific findings in this patient's case which indicate that the characteristic growth deficiencies and/or facial features are, to some extent, compatible with FAS, but alcohol exposure during gestation is unknown and at this time there is no clear evidence of cognitive or behavioral problems that strongly suggest brain damage. At such time in the future that brain damage is found through images of the brain, neurologic testing or cognitive behavioral assessment, and a confirmed history of alcohol exposure is obtained, then further diagnostic consideration would be appropriate. Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

_____ _____

Physician's Signature Date

P

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis **(1) No cognitive/behavioral or sentinel physical findings detected**
(2) Alcohol exposure unknown

In this current assessment, it is unknown whether or not this patient was exposed to alcohol during gestation. Furthermore, no specific cognitive, behavioral, or characteristic physical findings were detected in our examination.

No alcohol related diagnoses are offered at this time. Re-evaluation would be appropriate in the future if further history of alcohol use in pregnancy is documented or problems arise that strongly suggested brain damage, growth deficiency, or facial dysmorphology.

_____ _____

Physician's Signature Date

Q

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis
(1) Static encephalopathy
(2) Sentinel physical findings
(3) No alcohol exposure

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of facial characteristics, and evidence of brain damage in individuals exposed to alcohol during gestation.

In this patient's case, some but not all of the characteristic growth and facial features associated with FAS were present, there was evidence of brain damage, and the patient was reportedly not exposed to alcohol during gestation. Based on these observations, which are documented on the attached pages, this patient does not have FAS, but does have static encephalopathy and some of the physical characteristics found after alcohol exposure. Static encephalopathy literally means non-progressive brain dysfunction. A number of factors other than alcohol could be contributing to the patient's current cognitive/behavioral problems such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth. The physical findings may suggest that other syndrome diagnoses be considered.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal, then further diagnostic consideration would be appropriate. . Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

Individuals with static encephalopathy have brain damage which is a major component of their cognitive and behavioral problems and they should be viewed as a person with a disability. The static encephalopathy diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

R

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Static encephalopathy**
(2) No alcohol exposure

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation.

In this patient's case, no growth deficiency or characteristic set of facial features were found and the patient was not exposed to alcohol during gestation so the patient does not have FAS, but there was evidence of brain damage as you will see noted on the attached pages. In this situation, we use the term "static encephalopathy" to describe the patient's condition. Static encephalopathy literally means non-progressive brain dysfunction. On the attached sheets are the specific findings in this patient's case that led us to this conclusion. A number of factors could be contributing to the patient's current cognitive/behavioral problems such as the patient's genetic background, other potential exposures or problems during pregnancy, and various experiences since birth.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal, then further diagnostic consideration would be appropriate. . Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

Individuals with static encephalopathy have brain damage that is a major component of their cognitive and behavioral problems and they should be viewed as individuals with disabilities. The static encephalopathy diagnosis has implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

S

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis
(1) Neurobehavioral disorder
(2) Sentinel physical findings
(3) No alcohol exposure

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation.

On the attached sheets you will find our specific observations in this case. We found that some, but not all, of the sentinel physical findings seen in patients with FAS were present and the patient was reportedly not exposed to alcohol during gestation. There was not strong evidence that the patient's cognitive/behavioral problems were clearly due to brain damage, but there were suggestions that this may be the case. In this situation we use the term "neurobehavioral disorder" to emphasize the possibility that the problems may not be entirely due to postnatal experiences. The patient also had some of the physical characteristics often found with alcohol exposure. In this case, however, there was no alcohol exposure, therefore, these physical findings might suggest that other syndrome diagnoses be considered. Certainly a number of factors could be contributing to the patient's condition such as genetic background, other potential exposures or problems during pregnancy, and various experiences since birth.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal or if further testing finds further evidence of brain damage, then further diagnostic consideration would be appropriate.

In any event, the diagnosis of neurobehavioral disorder means that issues of abnormal brain structure and brain impairment need to be considered with implications for educational planning, societal expectations, and health. On the attached sheet, you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

T

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Neurobehavioral disorder**
(2) No alcohol exposure

Fetal alcohol syndrome (FAS) is defined by evidence of growth deficiency, a specific set of facial characteristics, and evidence of brain damage in individuals exposed to alcohol during gestation.

On the attached sheets you will find our specific observations in this case. In this patient's case, no growth deficiency or characteristic set of facial features were found and the patient was not exposed to alcohol during gestation so the patient does not have FAS. Although there was not strong evidence that the patient's cognitive/behavioral problems were clearly due to brain damage, there were suggestions that this may be the case. In this situation we use the term "neurobehavioral disorder" to emphasize the possibility that the problems may not be entirely due to postnatal experiences. Certainly a number of other factors could be contributing to the patient's condition such as genetic background, other potential exposures or problems during gestation, and various experiences since birth.

The diagnosis made today is based on the information available at the time of this assessment. In the event that a confirmed history of alcohol exposure is obtained, or if the patient's facial features or growth become more abnormal or if further testing finds further evidence of brain damage, then further diagnostic consideration would be appropriate. Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

Whatever the cause, the diagnosis of neurobehavioral disorder means that issues of abnormal brain structure and brain impairment need to be considered with implications for educational planning, societal expectations, and health. On the attached sheet you will find a list of specific problems that have been identified that need attention.

_____ _____

Physician's Signature Date

U

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis: **(1) Sentinel physical findings**
(2) No alcohol exposure

Fetal Alcohol Syndrome (FAS) is defined by evidence of growth deficiency, a specific set of subtle facial anomalies and evidence of brain damage occurring in patients exposed to alcohol during gestation.

On the attached sheets are the specific findings in this patient's case which indicate that characteristic growth deficiencies and/or facial features, compatible with FAS, were present even though the patient was not exposed to alcohol during gestation. In this case, these physical findings might suggest that other syndrome diagnoses be considered.

At such time in the future that brain damage is found through images of the brain, neurologic testing or cognitive behavioral assessment, and/or a confirmed history of alcohol exposure is obtained, then further diagnostic consideration would be appropriate. Alternately other birth defect syndromes not related to alcohol exposure may also need reconsideration.

_____ _____

Physician's Signature Date

V

THE FETAL ALCOHOL SYNDROME CLINIC
DIAGNOSTIC SUMMARY

Final Diagnosis **(1) No cognitive/behavioral or sentinel physical findings detected**
(2) No alcohol exposure

In this current assessment, we conclude that this patient was not exposed to alcohol during gestation. Furthermore, no specific cognitive, behavioral, or characteristic physical findings were detected in our examination.

No diagnoses are offered at this time. Re-evaluation would be appropriate in the future if further history of alcohol use in pregnancy is documented or problems arise that strongly suggested brain damage, growth deficiency, or facial dysmorphology.

_____ _____

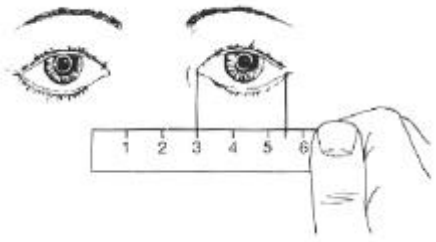
Physician's Signature Date

VIII. Reference Charts of Normal Growth

The attached charts should be used to record standardized measures of palpebral fissure length, inner canthal distance, head circumference, height, weight, and parental height adjustment on the FAS Diagnostic Evaluation Form.

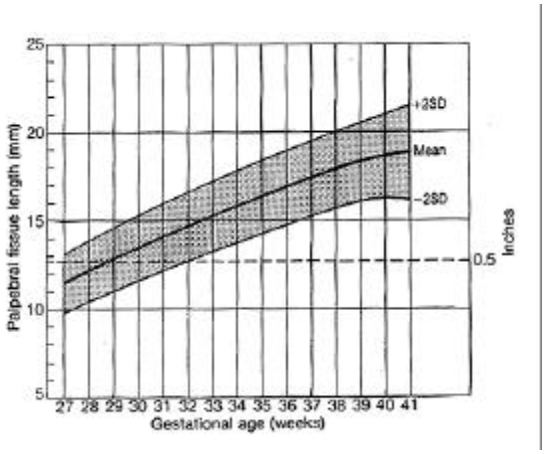
Palpebral Fissure Distance

(From Hall et. al., 1989, by permission)[18]

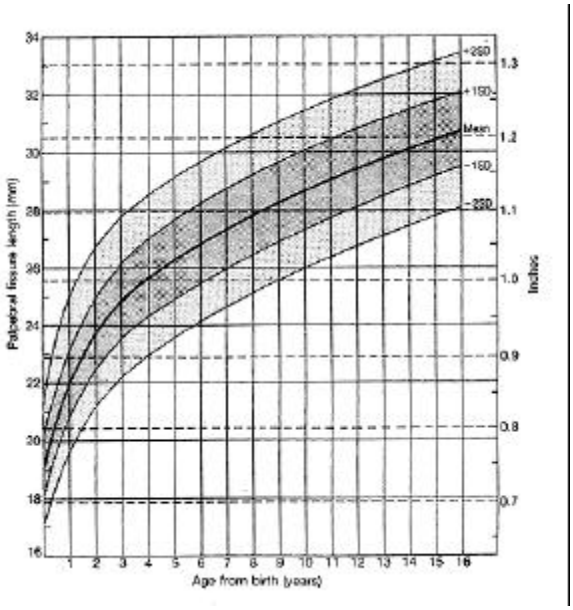


Measure from the inner to the outer canthi.

Have patient look up while holding head level to standardize and maximize fissure length.



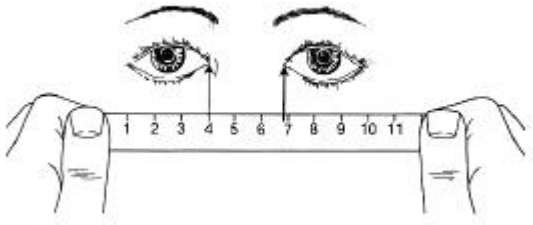
Palpebral fissure length, both sexes, at birth.



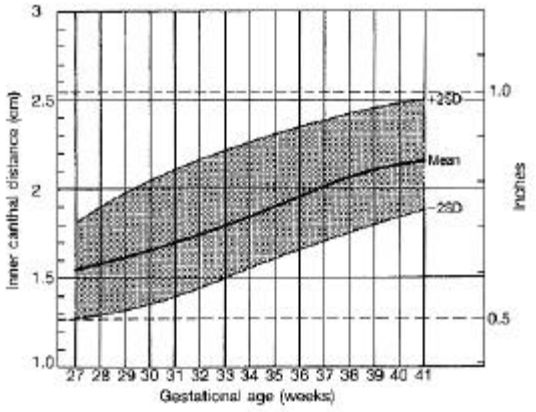
Palpebral fissure length, both sexes, birth to 16 years.

Inner Canthal Distance

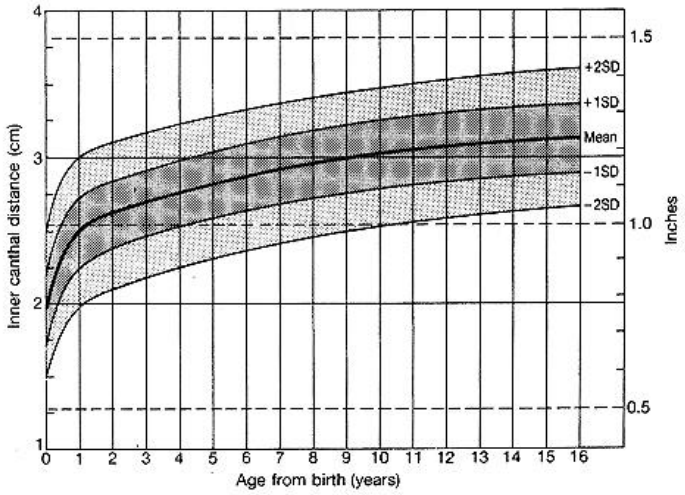
(From Hall et. al., 1989, by permission) [18]



Measure from the innermost corner of each eye, in a straight line avoiding the curvature of the nose.



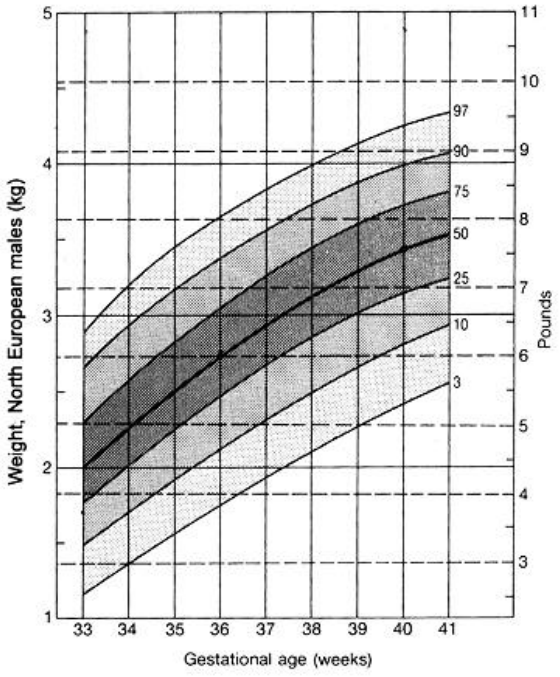
Inner canthal distance, both sexes, at birth.



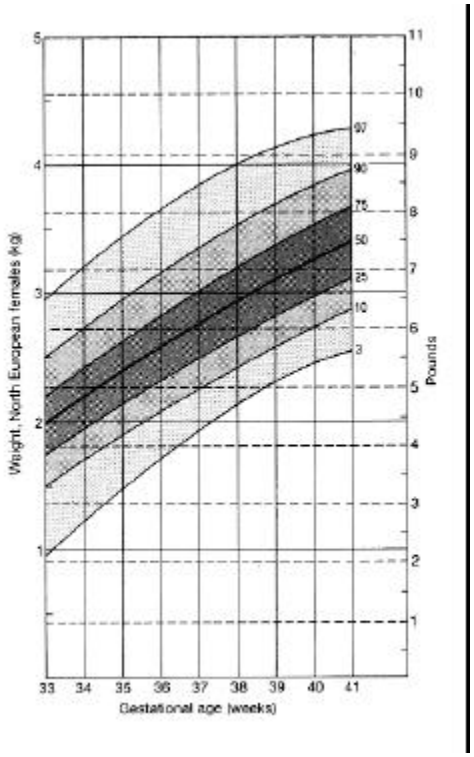
Inner canthal distance, both sexes, birth to 16 years.

Birth Weight

(Hall et. al., 1989, by permission) [18]



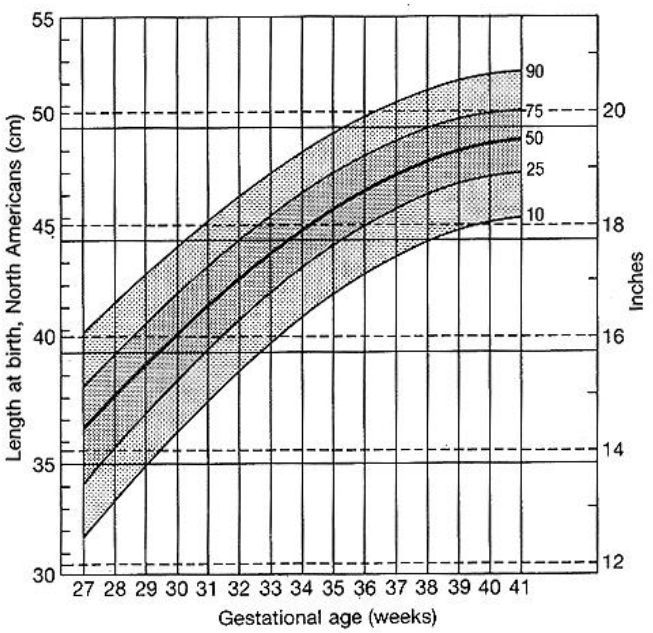
North European males at birth



North European females at birth

Birth Length

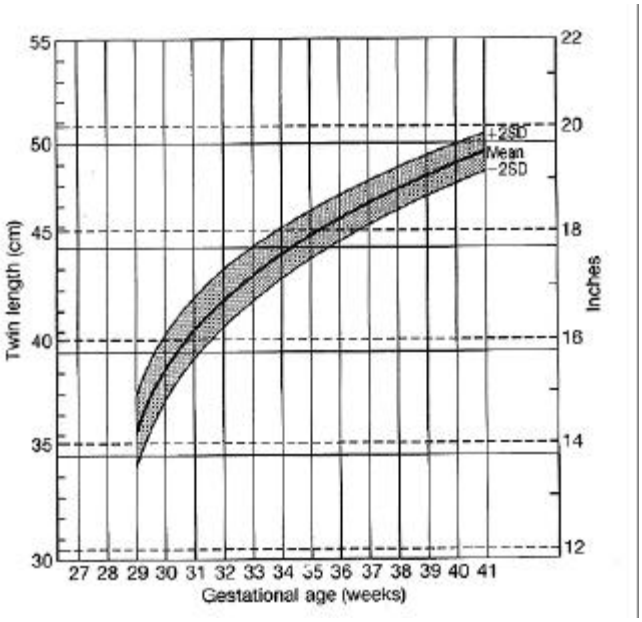
(Hall et. al., 1989, by permission) [18]



Length at birth, North Americans, both sexes.

Birth Length, Twin

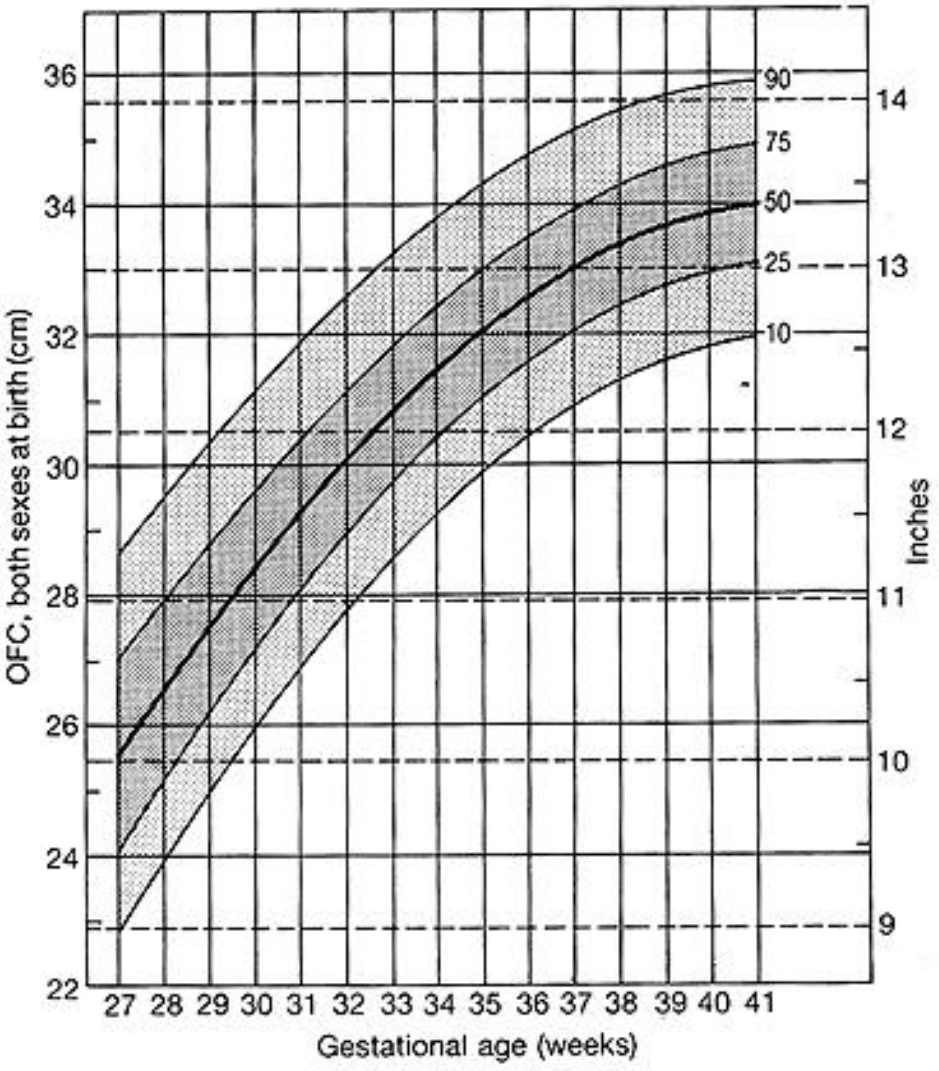
(Hall et. al., 1989, by permission) [18]



Twin length at birth, both sexes.

Head Circumference

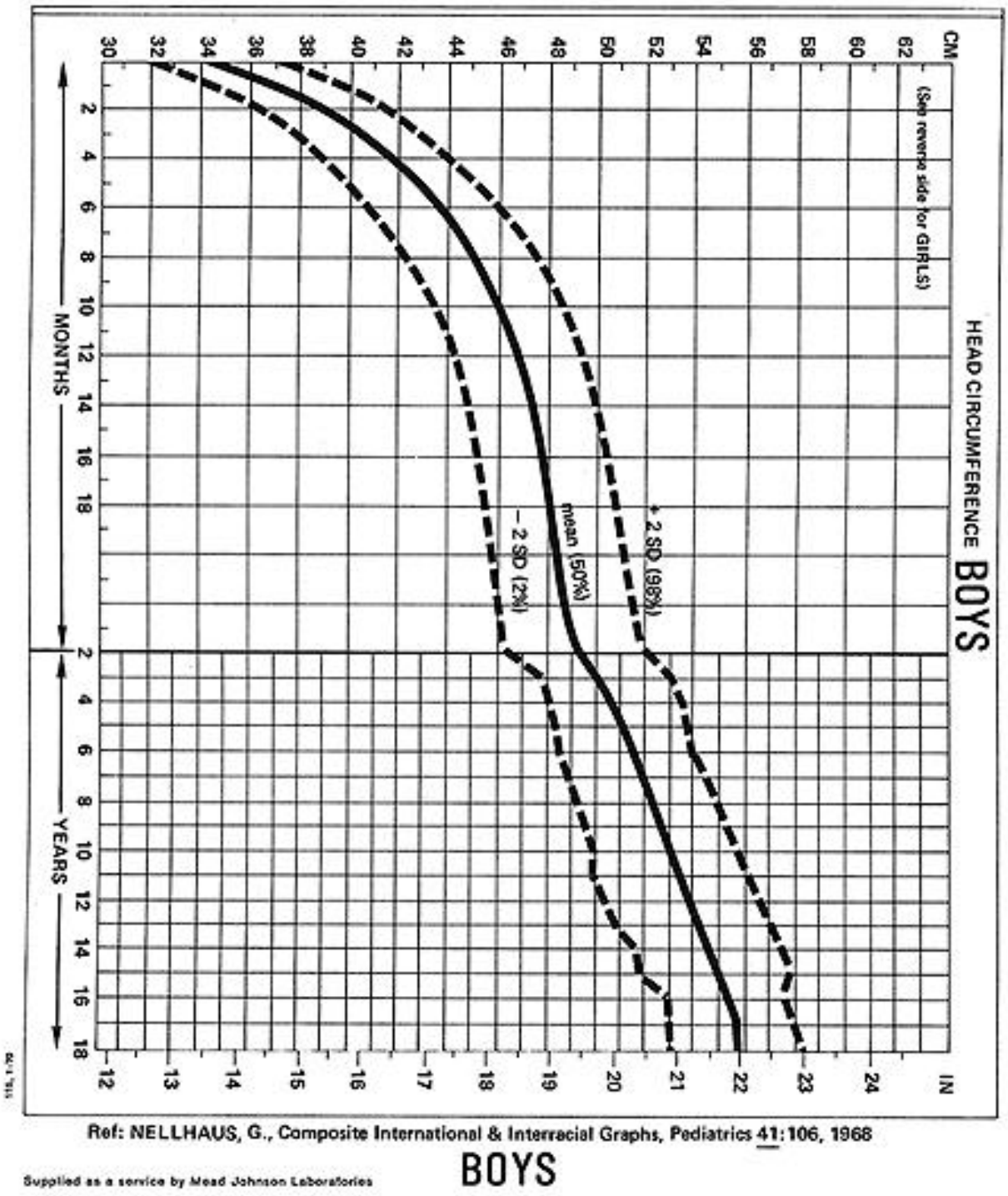
(Hall et. al., 1989, by permission) [18]



Head circumference, both sexes, at birth.

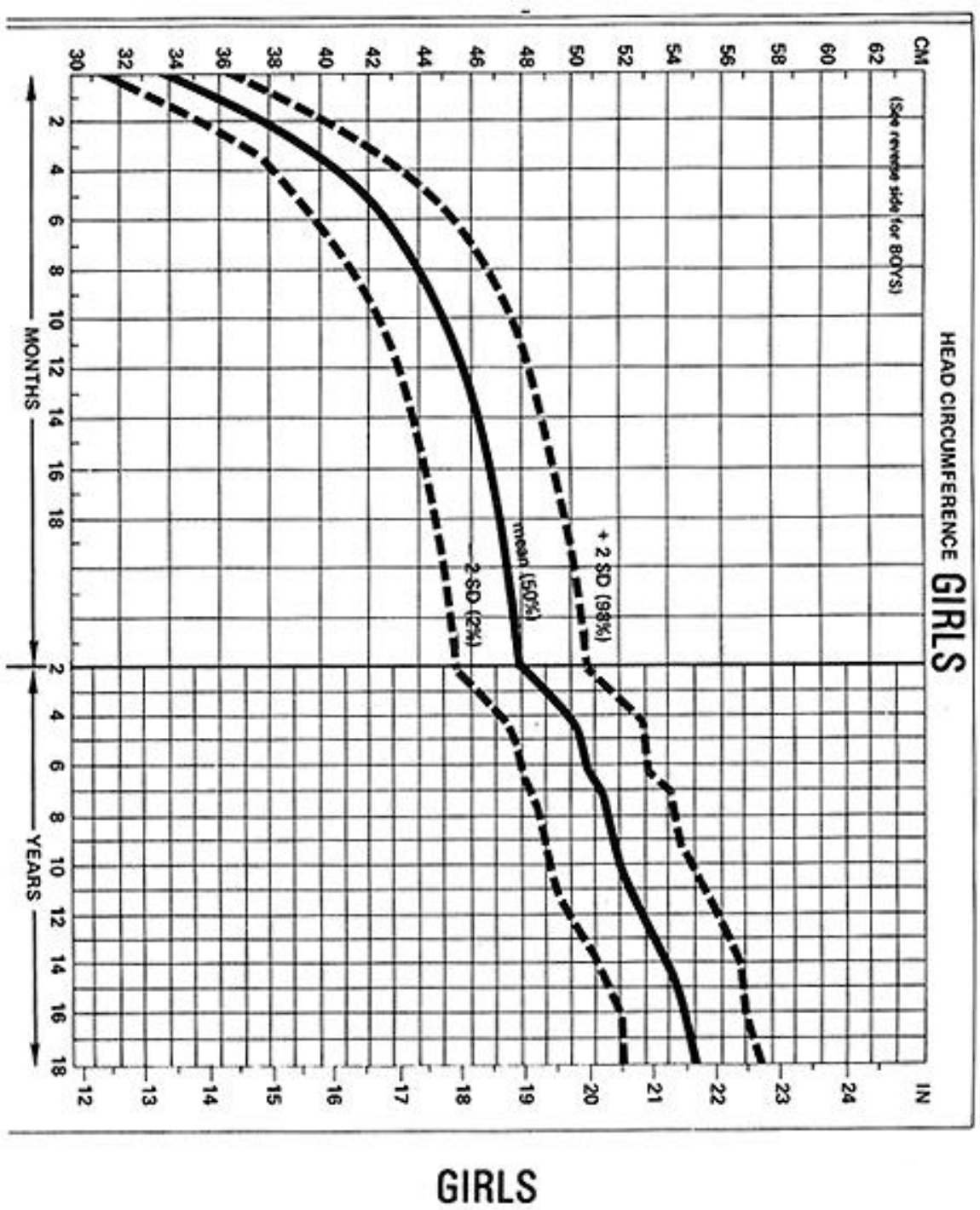
Head Circumference BOYS

(Mead Johnson Nutritionals by permission)[21]



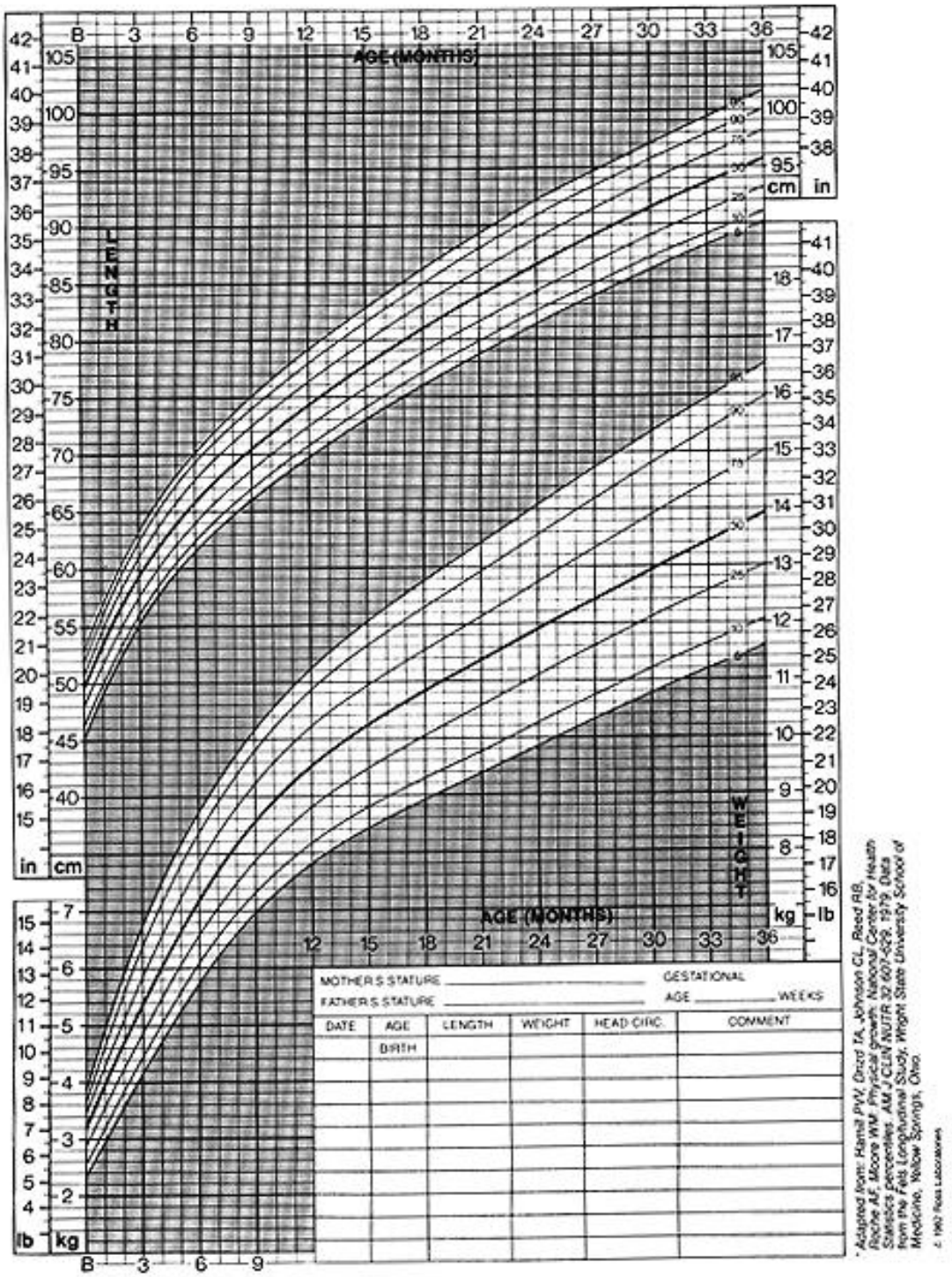
Head Circumference GIRLS

(Mead Johnson Nutritionals by permission) [21]



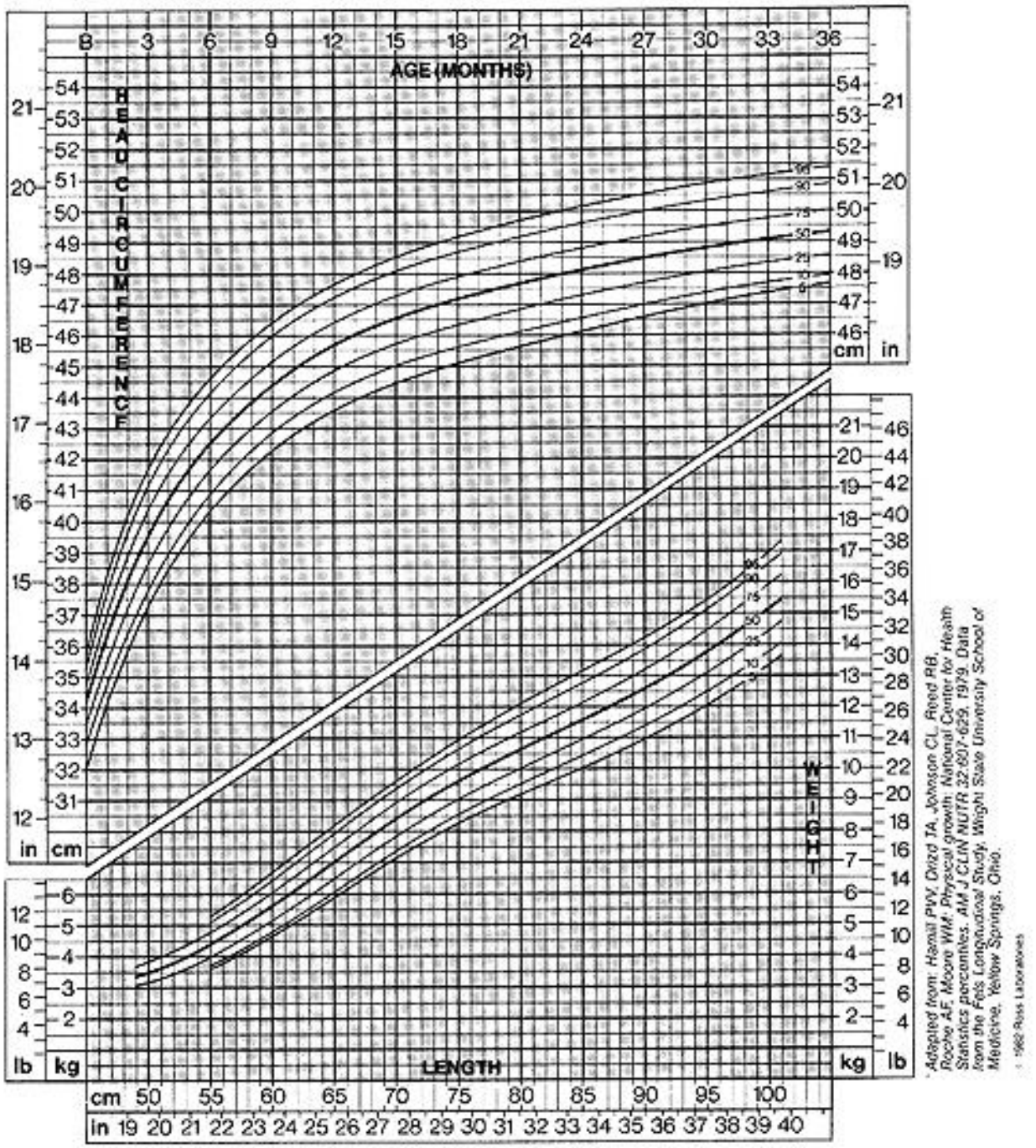
Girls: Birth to 36 Months, Height and Weight, NCHS Percentiles

(Ross Products Division by permission)[22]



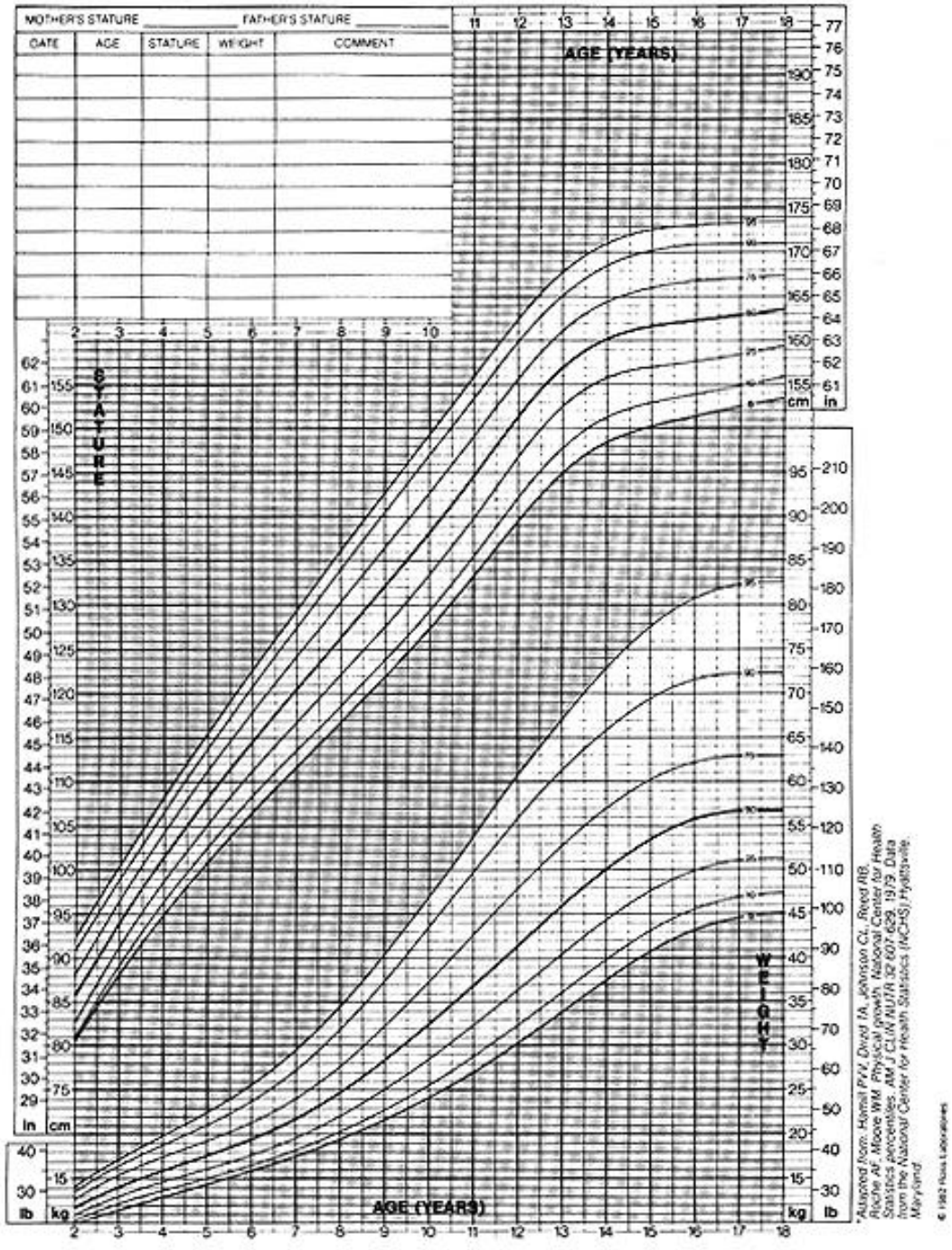
Girls: Birth to 36 Months, Head Circumference, NCHS Percentiles

(Ross Products Division by permission)[22]



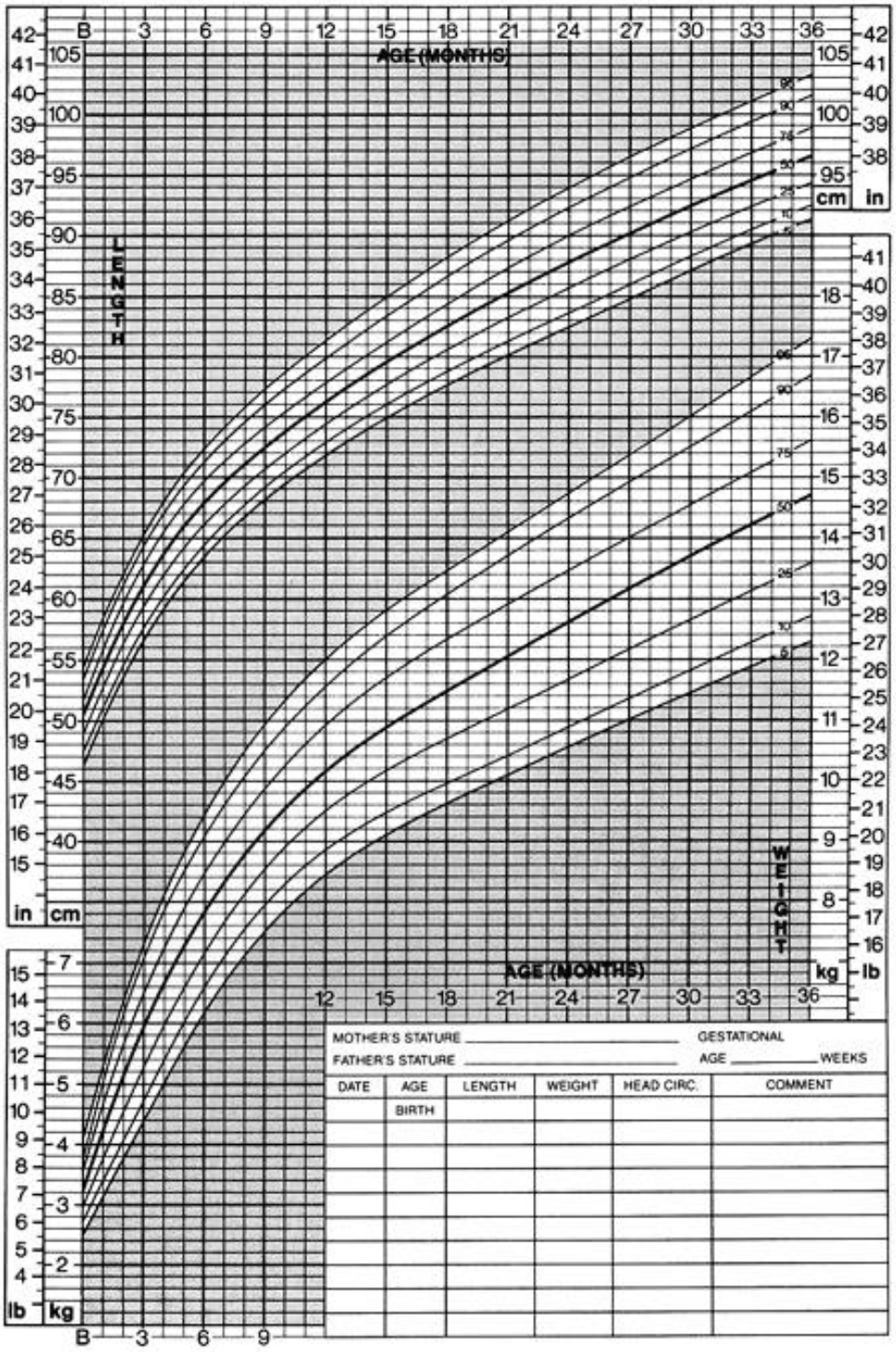
Girls: 2 to 18 Years, Height and Weight, NCHS Percentiles

(Ross Products Division by permission)[23]



Boys: Birth to 36 Months, Height and Weight, NCHS Percentiles

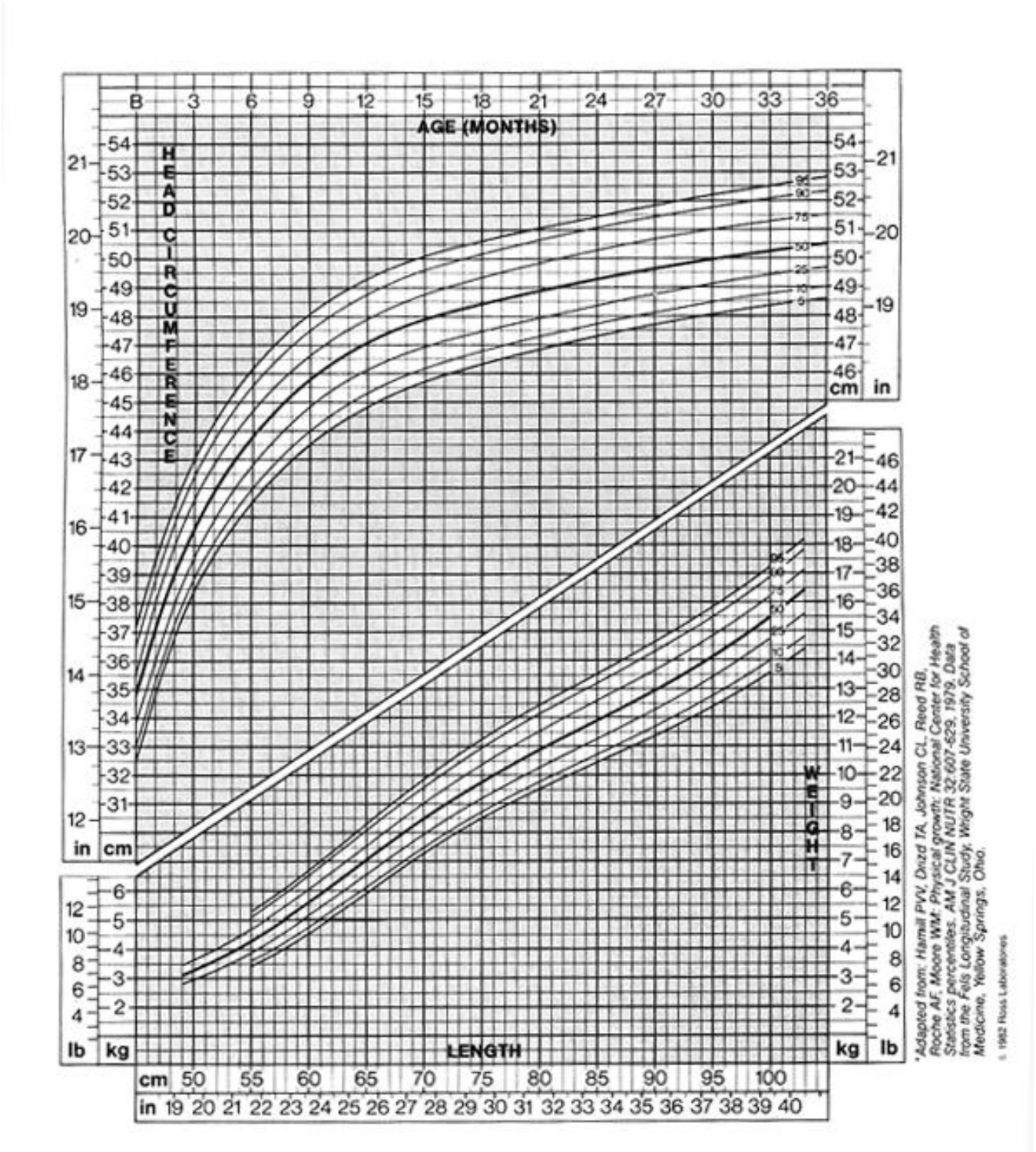
(Ross Products Division by permission)[23]



*Adapted from: Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM: Physical growth: National Center for Health Statistics percentiles. AM J CLIN NUTR 32:607-629, 1979. Data from the Fels Longitudinal Study, Wright State University School of Medicine, Yellow Springs, Ohio.

Boys: Birth to 36 Months, Head Circumference, NCHS Percentiles

(Ross Products Division by permission) [22]



Boys: 2 to 18 Years, Height and Weight, NCHS Percentiles

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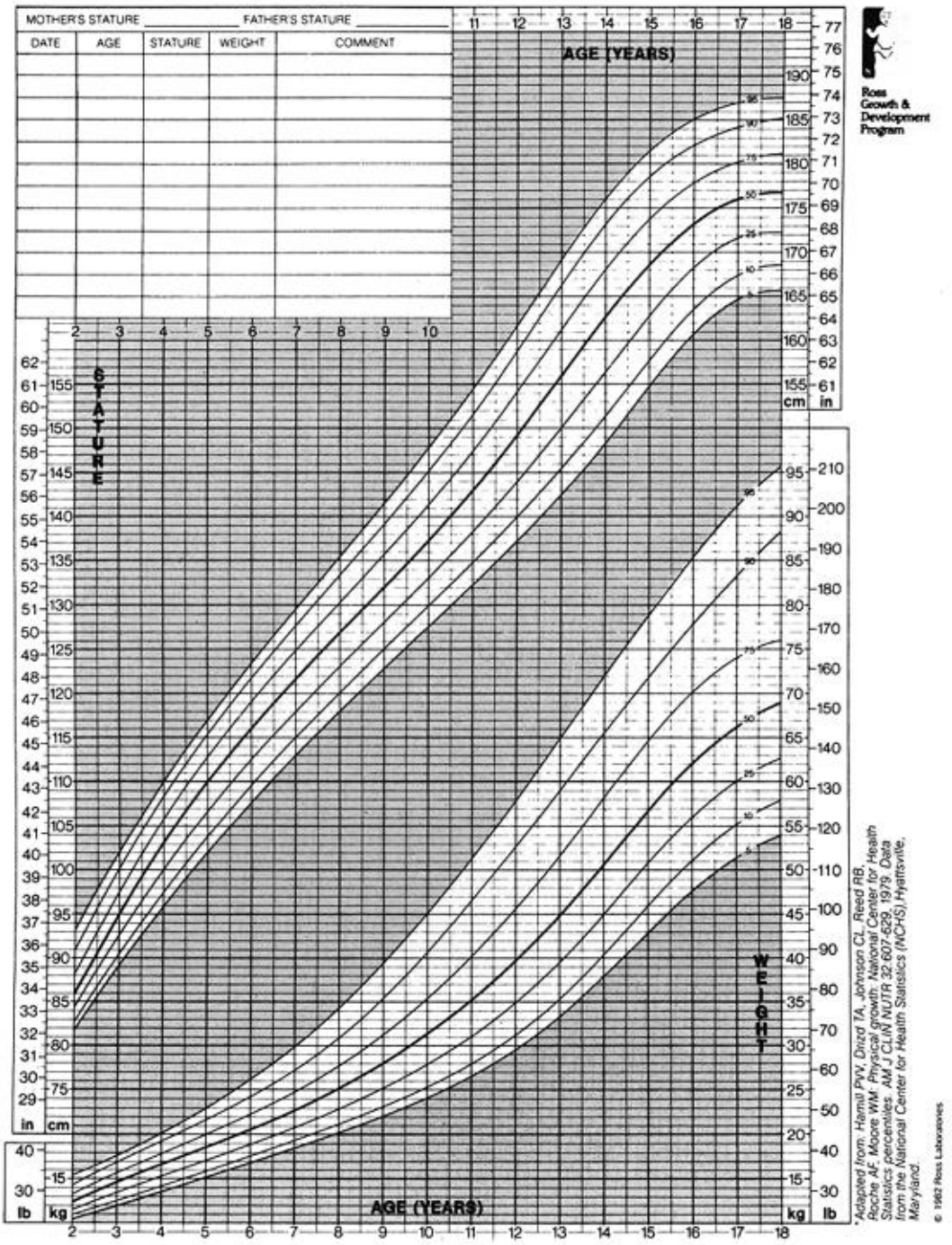

Parent Specific Adjustments for Evaluation of Length and Stature

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Ross
Growth &
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Program

PARENT-SPECIFIC ADJUSTMENTS FOR EVALUATION OF LENGTH AND STATURE — BOYS

Recumbent length and stature (standing height) are affected by both genetic and nongenetic factors. The genetic component should be considered when concern arises that diet or disease may have retarded or accelerated growth. Adjustment of length or stature to take parental stature into account may help identify or explain the nature of a growth problem. Such adjustment may prompt diagnostic studies or suggest a genetic basis for the growth problem.

Parent-specific adjustment procedures have been developed for US children by Himes, Roche, and Thissen.[1,2] The accompanying tables of adjustments are adapted from their research. Parent-specific adjustments need not be done routinely but should be considered when a child has unusual length or stature. As a guideline for applying parent-specific adjustments, "unusual" may be defined as below the 5th percentile or above the 95th percentile in length or stature for age.

Occasionally, a child's length or stature may appear normal, but the parents (one or both) are very tall or very short. Under such circumstances, parent-specific adjustment also is appropriate. Rapid decrease or increase in a child's percentile for length or stature generally is not an indication for applying parent-specific adjustments because the cause is more likely to be nongenetic than genetic.

1. Himes JH, Roche AF, Thissen D: *Parent-Specific Adjustments for Assessment of Recumbent Length and Stature*. Monographs in Paediatrics. Basel, Switzerland: S Karger, 1981, vol 13.
2. Himes JH, Roche AF, Thissen D, Moore WM: Parent-specific adjustments for evaluation of recumbent length and stature of children. *Pediatrics* 75:304-313, 1985.

Table 1. Metric Equivalents (cm) for Length and Stature

INCHES	0	¼	½	¾	INCHES	0	¼	½	¾	INCHES	0	¼	½	¾
12	30.5	31.1	31.7	32.4	36	91.4	92.1	92.7	93.3	60	152.4	153.0	153.7	154.3
13	33.0	33.7	34.3	34.9	37	94.0	94.6	95.2	95.9	61	154.9	155.6	156.2	156.8
14	35.6	36.2	36.8	37.5	38	96.5	97.2	97.8	98.4	62	157.5	158.1	158.7	159.4
15	38.1	38.7	39.4	40.0	39	99.1	99.7	100.3	101.0	63	160.0	160.7	161.3	161.9
16	40.6	41.3	41.9	42.5	40	101.6	102.2	102.9	103.5	64	162.6	163.2	163.8	164.5
17	43.2	43.8	44.4	45.1	41	104.1	104.8	105.4	106.0	65	165.1	165.7	166.4	167.0
18	45.7	46.4	47.0	47.6	42	106.7	107.3	107.9	108.6	66	167.6	168.3	168.9	169.5
19	48.3	48.9	49.5	50.2	43	109.2	109.9	110.5	111.1	67	170.2	170.8	171.4	172.1
20	50.8	51.4	52.1	52.7	44	111.8	112.4	113.0	113.7	68	172.7	173.4	174.0	174.6
21	53.3	54.0	54.6	55.2	45	114.3	114.9	115.6	116.2	69	175.3	175.9	176.5	177.2
22	55.9	56.5	57.1	57.8	46	116.8	117.5	118.1	118.7	70	177.8	178.4	179.1	179.7
23	58.4	59.1	59.7	60.3	47	119.4	120.0	120.6	121.3	71	180.3	181.0	181.6	182.2
24	61.0	61.6	62.2	62.9	48	121.9	122.6	123.2	123.8	72	182.9	183.5	184.1	184.8
25	63.5	64.1	64.8	65.4	49	124.5	125.1	125.7	126.4	73	185.4	186.1	186.7	187.3
26	66.0	66.7	67.3	67.9	50	127.0	127.6	128.3	128.9	74	188.0	188.6	189.2	189.9
27	68.6	69.2	69.8	70.5	51	129.5	130.2	130.8	131.4	75	190.5	191.1	191.8	192.4
28	71.1	71.8	72.4	73.0	52	132.1	132.7	133.3	134.0	76	193.0	193.7	194.3	194.9
29	73.7	74.3	74.9	75.6	53	134.6	135.3	135.9	136.5	77	195.6	196.2	196.8	197.5
30	76.2	76.8	77.5	78.1	54	137.2	137.8	138.4	139.1	78	198.1	198.8	199.4	200.0
31	78.7	79.4	80.0	80.6	55	139.7	140.3	141.0	141.6	79	200.7	201.3	201.9	202.6
32	81.3	81.9	82.5	83.2	56	142.2	142.9	143.5	144.1	80	203.2	203.8	204.5	205.1
33	83.8	84.5	85.1	85.7	57	144.8	145.4	146.0	146.7	81	205.7	206.4	207.0	207.6
34	86.4	87.0	87.6	88.3	58	147.3	148.0	148.6	149.2	82	208.3	208.9	209.5	210.2
35	88.9	89.5	90.2	90.8	59	149.9	150.5	151.1	151.8	83	210.8	211.5	212.1	212.7

Parent Specific Adjustments for Evaluation of Length and Stature (continued)

Instructions

INSTRUCTIONS

1. Measure and record mother's stature.
2. Measure and record father's stature.
3. When one parent's stature cannot be measured, the measured parent's estimate of the other parent's stature (in cm) can be substituted for measured stature, and midparent stature can be calculated as in instruction 4. Alternatively, the measured parent's perception of the other parent's stature (short, medium, or tall) can be used to determine midparent stature directly from Table 4.

Table 4. Midparent Stature (cm) When Measured Parent Reports Other Parent's Stature as Short, Medium, or Tall

Measured Parent's Stature (cm)	Midparent Stature (cm)* When Mother Reports Father's Stature as Short†	Medium†	Tall†	When Father Reports Mother's Stature as Short‡	Medium‡	Tall‡
146	156	162	166	150	154	158
148	158	162	166	152	156	160
150	158	164	168	152	156	160
152	160	164	168	154	158	162
154	160	166	170	154	158	162
156	162	166	170	156	160	164
158	162	168	172	156	160	164
160	164	168	172	158	162	166
162	164	170	174	158	162	166
164	166	170	174	160	164	168
166	166	172	176	160	164	168
168	168	172	176	162	166	170
170	168	174	178	162	166	170
172	170	174	178	164	168	172
174	170	176	180	164	168	172
176	172	176	180	166	170	174
178	172	178	182	166	170	174
180	174	178	182	168	172	176
182	174	180	184	168	172	176
184	176	180	184	170	174	178
186	176	182	—	170	174	178
188	178	182	—	172	176	180
190	178	184	—	172	176	180
192	180	184	—	174	178	182
194	180	—	—	174	178	182
196	182	—	—	176	180	184
198	182	—	—	176	180	184

* All midparent statures are rounded to the nearest 2 cm to facilitate use of Tables 2 and 3.
† Values for father's stature used in calculations of midparent stature: short, 167.6 cm (5 ft 6 in.); medium, 176.3 cm (5 ft 9½ in.); tall, 185.4 cm (6 ft 1 in.).
‡ Values for mother's stature used in calculations of midparent stature: short, 154.9 cm (5 ft 1 in.); medium, 162.6 cm (5 ft 4 in.); tall, 170.7 cm (5 ft 7¼ in.).

4. Calculate midparent stature by adding the mother's stature and the father's stature in cm and dividing by two. Metric equivalents for stature are shown in Table 1.
5. Measure, record, and plot the boy's length (birth to 36 months) or stature (3 to 18 years) in cm on the appropriate growth chart that displays the National Center for Health Statistics (NCHS) percentiles. Metric equivalents for length and stature are shown in Table 1.
6. Calculate the boy's adjusted length or stature by using the parent-specific adjustments from Table 2 for length or from Table 3 for stature:
   a. Locate the age closest to that achieved by the boy.
   b. For that age, locate the horizontal row that includes the boy's length or stature.
   c. Locate the vertical column closest to the midparent stature for the boy's mother and father.
   d. The parent-specific adjustment (in cm) appears at the row-column intersection.
   e. Add the parent-specific adjustment to the boy's length or stature if the factor has no sign; subtract the adjustment if it has a minus sign.
7. Determine the boy's parent-specific adjusted percentile by plotting adjusted length or stature on the appropriate NCHS growth chart. Clearly label plotted measurements as being actual or adjusted values.

Interpretation: A boy at a low percentile for actual length or stature whose parents are short probably is genetically short. However, his shortness, particularly if it is extreme, may have additional contributing factors that should be considered.

If the boy's adjusted percentile is low, his growth probably has been slowed by nongenetic factors, and diagnostic studies should be considered. If the parents are tall, the boy's adjusted percentile will be lower than his actual percentile, and his shortness is more likely due to malnutrition or disease.

A boy at a high adjusted percentile for length or stature most often will be found to have accelerated maturation. Rarely, a specific disorder such as Marfan's syndrome or pituitary gigantism may be responsible for the boy's unusual length or stature.

Follow-Up: Counseling may be advisable when a boy is judged to be genetically short or tall. Additional contributing factors should be considered and growth monitored to confirm the relative stability of the boy's length or stature percentile.

Further investigation and modification of diet or specific therapy are indicated for a boy with unusual length or stature due to malnutrition or disease. Growth should be monitored to evaluate the effectiveness of dietary management or drug therapy.

Example #1. Boy aged 12 months, length 28 in., mother's stature 60½ in., and father's stature 65¼ in.

Son's actual length in cm is 71.1 (from Table 1).
Son's actual percentile is below the 5th (from NCHS growth chart).
Mother's stature in cm is 153.7 (from Table 1).
Father's stature in cm is 165.7 (from Table 1).
Midparent stature is $\frac{153.7 + 165.7}{2} = 159.7$ cm.
Adjustment is 2 cm (from Table 2).
Son's adjusted length is 71.1 cm + 2 cm = 73.1 cm.
Son's adjusted percentile is between the 10th and 25th (from NCHS growth chart).
Interpretation: Probably genetically short. Consider additional contributing factors.

Example #2. Boy aged 8 years, stature 47¼ in., mother's stature 68½ in., and father's stature reported as "tall."

Son's actual stature in cm is 120.0 (from Table 1).
Son's actual percentile is 10th (from NCHS growth chart).
Mother's stature in cm is 174.0 (from Table 1).
Midparent stature is 180.0 cm (from Table 4).
Adjustment is − 7 cm (from Table 3).
Son's adjusted stature is 120.0 cm − 7 cm = 113.0 cm.
Son's adjusted percentile is below the 5th (from NCHS growth chart).
Interpretation: Probably nongenetically short. Further investigation is indicated.

Parent Specific Adjustments for Evaluation of Length and Stature

Boys from Birth to 36 Months

Age (Months)	Length (cm)	Midparent Stature (cm)																	
		150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184
Birth	40.0– 43.9	2	1	1	1	1	1	1	0	0	0	0	0	0	−1	−1	−1	−1	−1
	44.0– 52.9	2	2	1	1	1	1	1	0	0	0	0	0	0	−1	−1	−1	−1	−1
	53.0– 56.9	2	2	1	1	1	1	1	1	0	0	0	0	0	−1	−1	−1	−1	−1
1	40.0– 44.9	2	2	1	1	1	1	1	0	0	0	0	−1	−1	−1	−1	−1	−2	−2
	45.0– 48.9	2	2	2	1	1	1	1	0	0	0	0	0	−1	−1	−1	−1	−2	−2
	49.0– 52.9	2	2	2	1	1	1	1	1	0	0	0	0	−1	−1	−1	−1	−2	−2
	53.0– 56.9	2	2	2	2	1	1	1	1	0	0	0	0	−1	−1	−1	−1	−1	−2
	57.0– 62.9	2	2	2	2	1	1	1	1	1	0	0	0	0	−1	−1	−1	−1	−2
3	52.0– 56.9	3	2	2	2	1	1	1	1	0	0	0	−1	−1	−1	−1	−2	−2	−2
	57.0– 60.9	3	2	2	2	2	1	1	1	0	0	0	0	−1	−1	−1	−2	−2	−2
	61.0– 66.9	3	3	2	2	2	1	1	1	1	0	0	0	−1	−1	−1	−1	−2	−2
	67.0– 68.9	3	3	2	2	2	2	1	1	1	0	0	0	0	−1	−1	−1	−2	−2
6	62.0– 64.9	3	3	2	2	2	1	1	1	0	0	0	−1	−1	−1	−2	−2	−2	−3
	65.0– 66.9	3	3	3	2	2	2	1	1	1	0	0	−1	−1	−1	−2	−2	−2	−3
	67.0– 73.9	3	3	3	2	2	2	1	1	1	0	0	0	−1	−1	−1	−2	−2	−2
	74.0– 76.9	4	3	3	3	2	2	2	1	1	1	0	0	0	−1	−1	−1	−2	−2
9	66.0– 68.9	3	3	3	2	2	1	1	1	0	0	0	−1	−1	−2	−2	−2	−3	−3
	69.0– 72.9	4	3	3	3	2	2	1	1	1	0	0	−1	−1	−1	−2	−2	−2	−3
	73.0– 76.9	4	3	3	3	2	2	2	1	1	0	0	0	−1	−1	−1	−2	−2	−3
	77.0– 80.9	4	4	3	3	3	2	2	1	1	1	0	0	0	−1	−1	−2	−2	−2
12	67.0– 71.9	4	3	3	2	2	2	1	1	0	0	−1	−1	−1	−2	−2	−3	−3	−3
	72.0– 74.9	4	4	3	3	2	2	1	1	1	0	0	−1	−1	−1	−2	−2	−3	−3
	75.0– 78.9	4	4	3	3	2	2	2	1	1	0	0	0	−1	−1	−2	−2	−3	−3
	79.0– 82.9	4	4	3	3	3	2	2	1	1	1	0	0	−1	−1	−1	−2	−2	−3
	83.0– 84.9	4	4	4	3	3	2	2	2	1	1	0	0	−1	−1	−1	−2	−2	−3
18	73.0– 75.9	4	4	3	3	2	2	1	1	0	0	−1	−1	−2	−2	−2	−3	−3	−4
	76.0– 80.9	4	4	3	3	2	2	2	1	1	0	0	−1	−1	−2	−2	−3	−3	−4
	81.0– 84.9	5	4	4	3	3	2	2	1	1	0	0	−1	−1	−2	−2	−3	−3	−3
	85.0– 88.9	5	4	4	3	3	2	2	1	1	1	0	0	−1	−1	−2	−2	−3	−3
	89.0– 92.9	5	5	4	4	3	3	2	2	1	1	0	0	−1	−1	−2	−2	−2	−3
24	78.0– 82.9	5	4	4	3	3	2	2	1	0	0	−1	−1	−2	−2	−3	−3	−4	−5
	83.0– 86.9	5	5	4	4	3	2	2	1	1	0	0	−1	−2	−2	−3	−3	−4	−4
	87.0– 92.9	6	5	5	4	3	3	2	2	1	1	0	−1	−1	−2	−2	−3	−3	−4
	93.0– 96.9	6	5	5	4	4	3	3	2	1	1	0	0	−1	−1	−2	−3	−3	−4
30	85.0– 88.9	6	5	5	4	3	3	2	1	1	0	−1	−1	−2	−3	−3	−4	−4	−5
	89.0– 92.9	6	5	5	4	4	3	2	2	1	0	0	−1	−2	−2	−3	−3	−4	−5
	93.0– 96.9	6	6	5	4	4	3	3	2	1	1	0	−1	−1	−2	−3	−3	−4	−5
	97.0–100.9	7	6	5	5	4	3	3	2	2	1	0	0	−1	−2	−2	−3	−4	−4
36	88.0– 90.9	6	6	5	4	3	3	2	1	1	0	−1	−1	−2	−3	−4	−4	−5	−6
	91.0– 94.9	6	6	5	4	4	3	2	2	1	0	−1	−1	−2	−3	−3	−4	−5	−5
	95.0– 98.9	7	6	5	5	4	3	3	2	1	1	0	−1	−1	−2	−3	−4	−4	−5
	99.0–102.9	7	6	6	5	4	4	3	2	1	1	0	−1	−1	−2	−3	−3	−4	−5
	103.0–106.9	7	7	6	5	5	4	3	2	2	1	0	0	−1	−2	−2	−3	−4	−4

*Adapted from Himes JH, Roche AF, Thissen D: *Parent-Specific Adjustments for Assessment of Recumbent Length and Stature.* Monographs in Paediatrics. Basel, Switzerland: S Karger, 1981, vol 13, Table XII, pp 36-37.

Parent Specific Adjustments for Evaluation of Length and Stature

Boys from 3 to 18 Years

Age (Years)	Stature (cm)	Midparent Stature (cm)																		
		150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184
3	86.0– 87.9	7	6	5	5	4	3	2	1	1	0	−1	−2	−3	−3	−4	−5	−6	−7
	88.0– 97.9	8	7	6	5	4	4	3	2	1	0	−1	−1	−2	−3	−4	−5	−5	−6
	98.0–106.9	8	8	7	6	5	4	4	3	2	1	0	0	−1	−2	−3	−4	−4	−5
4	90.0– 93.9	7	6	5	4	4	3	2	1	0	−1	−1	−2	−3	−4	−5	−5	−6	−7
	94.0–103.9	8	7	6	5	4	3	3	2	1	0	−1	−1	−2	−3	−4	−5	−6	−6
	104.0–112.9	8	8	7	6	5	4	3	3	2	1	0	−1	−1	−2	−3	−4	−5	−6
5	96.0–103.9	8	7	6	5	4	3	2	1	0	0	−1	−2	−3	−4	−5	−6	−7	−8
	104.0–113.9	9	8	7	6	5	4	3	2	1	0	0	−1	−2	−3	−4	−5	−6	−7
	114.0–122.9	9	9	8	7	6	5	4	3	2	1	0	0	−1	−2	−3	−4	−5	−6
6	102.0–111.9	8	7	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−7	−8
	112.0–121.9	9	8	7	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−7
	122.0–130.9	10	9	8	7	6	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6
7	108.0–117.9	9	8	7	6	5	4	3	2	1	0	−1	−2	−4	−5	−6	−7	−8	−9
	118.0–127.9	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−4	−5	−6	−7	−8
	128.0–136.9	12	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−4	−5	−6	−7
8	114.0–115.9	10	9	8	6	5	4	3	2	1	−1	−2	−3	−4	−5	−6	−8	−9	−10
	116.0–125.9	11	9	8	7	6	5	4	2	1	0	−1	−2	−3	−5	−6	−7	−8	−9
	126.0–135.9	12	10	9	8	7	6	5	3	2	1	0	−1	−2	−4	−5	−6	−7	−8
	136.0–144.9	13	12	10	9	8	7	6	5	3	2	1	0	−1	−2	−4	−5	−6	−7
9	120.0–121.9	11	9	8	7	6	4	3	2	1	0	−2	−3	−4	−5	−7	−8	−9	−10
	122.0–131.9	11	10	9	8	6	5	4	3	1	0	−1	−2	−3	−5	−6	−7	−8	−10
	132.0–141.9	12	11	10	9	7	6	5	4	2	1	0	−1	−2	−4	−5	−6	−7	−9
	142.0–150.9	13	12	11	10	8	7	6	5	4	2	1	0	−1	−3	−4	−5	−6	−7
10	124.0–127.9	11	10	9	7	6	5	3	2	1	−1	−2	−3	−5	−6	−7	−9	−10	−11
	128.0–137.9	12	11	10	8	7	6	4	3	2	0	−1	−2	−4	−5	−6	−8	−9	−10
	138.0–147.9	13	12	11	9	8	7	5	4	3	1	0	−1	−3	−4	−5	−7	−8	−9
	148.0–158.9	14	13	12	11	9	8	7	5	4	3	1	0	−1	−3	−4	−5	−7	−8
11	128.0–133.9	12	10	9	8	6	5	4	2	1	0	−2	−3	−5	−6	−7	−9	−10	−11
	134.0–143.9	12	11	10	8	7	6	4	3	2	0	−1	−2	−4	−5	−6	−8	−9	−10
	144.0–153.9	14	12	11	10	8	7	5	4	3	1	0	−1	−3	−4	−5	−7	−8	−9
	154.0–162.9	15	13	12	11	9	8	7	5	4	3	1	0	−2	−3	−4	−6	−7	−8
12	132.0–141.9	12	10	9	8	6	5	4	2	1	0	−2	−3	−4	−6	−7	−8	−10	−11
	142.0–151.9	13	11	10	9	7	6	5	3	2	1	−1	−2	−3	−5	−6	−7	−9	−10
	152.0–161.9	13	12	11	9	8	7	5	4	3	1	0	−1	−2	−4	−5	−6	−8	−9
	162.0–170.9	14	13	12	10	9	8	6	5	4	2	1	0	−2	−3	−4	−6	−7	−8
13	136.0–139.9	12	10	9	8	6	5	4	2	1	−1	−2	−3	−5	−6	−7	−9	−10	−12
	140.0–149.9	12	11	10	8	7	6	4	3	1	0	−1	−3	−4	−6	−7	−8	−10	−11
	150.0–159.9	13	12	10	9	8	6	5	4	2	1	−1	−2	−3	−5	−6	−7	−9	−10
	160.0–169.9	14	13	11	10	8	7	6	4	3	2	0	−1	−3	−4	−5	−7	−8	−9
	170.0–178.9	15	13	12	11	9	8	6	5	4	2	1	0	−2	−3	−5	−6	−7	−9
14	142.0–145.9	13	11	10	8	7	5	4	2	1	−1	−2	−4	−5	−7	−8	−10	−11	−13
	146.0–155.9	14	12	11	9	8	6	5	3	1	0	−2	−3	−5	−6	−8	−9	−11	−12
	156.0–165.9	15	13	11	10	8	7	5	4	2	1	−1	−2	−4	−5	−7	−8	−10	−11
	166.0–175.9	15	14	12	11	9	8	6	5	3	2	0	−1	−3	−4	−6	−7	−9	−11
	176.0–184.9	16	15	13	12	10	9	7	6	4	3	1	−1	−2	−4	−5	−7	−8	−10
15	148.0–151.9	14	13	11	9	7	6	4	2	0	−1	−3	−5	−7	−8	−10	−12	−14	−15
	152.0–161.9	15	14	12	10	8	7	5	3	1	0	−2	−4	−6	−7	−9	−11	−13	−14
	162.0–171.9	17	15	13	11	10	8	6	4	3	1	−1	−3	−4	−6	−8	−10	−11	−13
	172.0–181.9	18	16	14	13	11	9	7	6	4	2	0	−1	−3	−5	−7	−8	−10	−12
	182.0–190.9	19	17	16	14	12	10	9	7	5	3	2	0	−2	−4	−5	−7	−9	−11
16	156.0–163.9	17	15	13	11	9	7	5	3	1	−1	−3	−5	−7	−9	−11	−13	−16	−18
	164.0–173.9	19	17	15	13	10	8	6	4	2	0	−2	−4	−6	−8	−10	−12	−14	−16
	174.0–183.9	21	19	17	15	12	10	8	6	4	2	0	−2	−4	−6	−8	−10	−12	−14
	184.0–192.9	23	21	19	17	14	12	10	8	6	4	2	0	−2	−4	−6	−8	−10	−12
17	162.0–165.9	17	15	13	11	9	7	4	2	0	−2	−4	−7	−9	−11	−13	−15	−17	−20
	166.0–175.9	20	17	15	13	11	9	6	4	2	0	−2	−4	−7	−9	−11	−13	−15	−18
	176.0–185.9	22	20	18	16	13	11	9	7	5	3	0	−2	−4	−6	−8	−11	−13	−15
	186.0–194.9	25	23	20	18	16	14	12	9	7	5	3	1	−1	−4	−6	−8	−10	−12
18	160.0–165.9	18	16	13	11	9	6	4	2	0	−3	−5	−7	−10	−12	−14	−17	−19	−21
	166.0–175.9	20	18	16	13	11	9	7	4	2	0	−3	−5	−7	−10	−12	−14	−17	−19
	176.0–185.9	23	21	19	16	14	12	9	7	5	3	0	−2	−4	−7	−9	−11	−14	−16
	186.0–194.9	26	24	22	19	17	15	12	10	8	6	3	1	−1	−4	−6	−8	−11	−13

Parent Specific Adjustments for Evaluation of Length and Stature

Girls from Birth to 36 Months

Age (mo)	Length (cm)	Midparent Stature (cm)																
		150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184
Birth	40.0–42.9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−1
	43.0–50.9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−1
	51.0–54.9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	46.0–56.9	1	1	1	1	1	1	0	0	0	0	0	0	0	0	−1	−1	−1	−1
	57.0–58.9	1	1	1	1	1	1	1	0	0	0	0	0	0	0	−1	−1	−1	−1
3	52.0–54.9	2	2	1	1	1	1	1	0	0	0	0	0	−1	−1	−1	−1	−2	−2
	55.0–60.9	2	2	2	1	1	1	1	1	0	0	0	0	−1	−1	−1	−1	−1	−2
	61.0–66.9	2	2	2	2	1	1	1	1	0	0	0	0	0	−1	−1	−1	−1	−1
6	58.0–60.9	3	2	2	2	1	1	1	1	0	0	0	−1	−1	−1	−2	−2	−2	−3
	61.0–63.9	3	3	2	2	2	1	1	1	0	0	0	−1	−1	−1	−2	−2	−2	−2
	64.0–68.9	3	3	2	2	2	1	1	1	1	0	0	0	−1	−1	−1	−2	−2	−2
	69.0–72.9	3	3	3	2	2	2	1	1	1	0	0	0	−1	−1	−1	−1	−2	−2
9	64.0–66.9	4	3	3	2	2	2	1	1	0	0	0	−1	−1	−2	−2	−3	−3	−3
	67.0–70.9	4	3	3	3	2	2	1	1	1	0	0	−1	−1	−1	−2	−2	−3	−3
	71.0–73.9	4	4	3	3	2	2	2	1	1	0	0	0	−1	−1	−2	−2	−2	−3
	74.0–76.9	4	4	3	3	3	2	2	1	1	1	0	0	−1	−1	−1	−2	−2	−3
12	66.0–68.9	4	4	3	3	2	2	1	1	0	0	−1	−1	−2	−2	−3	−3	−4	−4
	69.0–72.9	4	4	3	3	2	2	1	1	1	0	0	−1	−1	−2	−2	−3	−3	−4
	73.0–77.9	5	4	4	3	3	2	2	1	1	0	0	−1	−1	−2	−2	−3	−3	−4
	78.0–82.9	5	5	4	4	3	3	2	2	1	1	0	0	−1	−1	−2	−2	−3	−3
18	74.0–76.9	5	4	4	3	2	2	1	1	0	0	−1	−1	−2	−2	−3	−4	−4	−5
	77.0–80.9	5	4	4	3	3	2	2	1	1	0	0	−1	−2	−2	−3	−3	−4	−4
	81.0–84.9	5	5	4	4	3	3	2	2	1	0	0	−1	−1	−2	−2	−3	−3	−4
	85.0–88.9	6	5	5	4	4	3	2	2	1	1	0	0	−1	−1	−2	−2	−3	−4
24	77.0–80.9	5	4	4	3	3	2	1	1	0	0	−1	−2	−2	−3	−3	−4	−5	−5
	81.0–84.9	5	5	4	4	3	2	2	1	1	0	−1	−1	−2	−2	−3	−4	−4	−5
	85.0–88.9	6	5	5	4	3	3	2	2	1	0	0	−1	−1	−2	−3	−3	−4	−4
	89.0–92.9	6	6	5	4	4	3	3	2	1	1	0	0	−1	−2	−2	−3	−3	−4
	93.0–94.9	7	6	5	5	4	4	3	2	2	1	1	0	−1	−1	−2	−2	−3	−4
30	83.0–84.9	6	5	4	4	3	2	2	1	0	0	−1	−2	−2	−3	−4	−4	−5	−6
	85.0–89.9	6	5	5	4	3	3	2	1	1	0	−1	−1	−2	−3	−3	−4	−5	−5
	90.0–94.9	7	6	5	5	4	3	3	2	1	1	0	−1	−1	−2	−3	−3	−4	−5
	95.0–97.9	7	6	6	5	4	4	3	2	2	1	0	0	−1	−2	−2	−3	−4	−4
36	87.0–88.9	6	5	5	4	3	3	2	1	0	0	−1	−2	−2	−3	−4	−5	−5	−6
	89.0–92.9	6	6	5	4	4	3	2	1	1	0	−1	−2	−2	−3	−4	−4	−5	−6
	93.0–96.9	7	6	5	5	4	3	2	2	1	0	0	−1	−2	−3	−3	−4	−5	−5
	97.0–100.9	7	7	6	5	4	4	3	2	1	1	0	−1	−1	−2	−3	−4	−4	−5
	101.0–104.9	8	7	6	6	5	4	4	3	2	1	0	0	−1	−1	−2	−3	−4	−4

[1] Adapted from Himes et al[3] and reprinted with permission from Ross Laboratories, Columbus, OH.

Parent Specific Adjustments for Evaluation of Length and Stature

Girls from 3 to 18 Years

Age (yr)	Stature (cm)	Midparent Stature (cm)																	
		150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180	182	184
3	82.0–83.9	6	5	4	4	3	2	1	1	0	−1	−1	−2	−3	−3	−4	−5	−6	−6
	84.0–93.9	6	6	5	4	3	3	2	1	1	0	−1	−1	−2	−3	−4	−4	−5	−6
	94.0–102.9	7	7	6	5	4	4	3	2	2	1	0	−1	−1	−2	−3	−3	−4	−5
4	92.0–93.9	6	6	5	4	3	3	2	1	0	0	−1	−2	−3	−3	−4	−5	−6	−7
	94.0–103.9	7	6	6	5	4	3	2	2	1	0	−1	−1	−2	−3	−4	−4	−5	−6
	104.0–112.9	8	7	7	6	5	4	3	3	2	1	0	0	−1	−2	−3	−3	−4	−5
5	100.0–101.9	8	7	6	5	4	3	2	1	1	0	−1	−2	−3	−4	−5	−5	−6	−7
	102.0–111.9	8	7	6	6	5	4	3	2	1	0	−1	−1	−2	−3	−4	−5	−6	−7
	112.0–120.9	9	8	7	7	6	5	4	3	2	1	1	0	−1	−2	−3	−4	−5	−6
6	106.0–109.9	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−7	−8
	110.0–119.9	9	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−7
	120.0–128.9	11	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6
7	112.0–117.9	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−7	−8
	118.0–127.9	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−7
	128.0–136.9	11	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6
8	116.0–123.9	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−6	−8	−9
	124.0–133.9	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−7	−8
	134.0–142.9	11	10	9	8	7	6	5	4	3	2	1	0	−1	−2	−3	−4	−6	−7
9	122.0–131.9	10	9	8	7	6	5	3	2	1	0	−1	−2	−3	−4	−5	−6	−7	−9
	132.0–141.9	11	10	9	8	7	6	4	3	2	1	0	−1	−2	−3	−4	−5	−7	−8
	142.0–150.9	12	11	10	9	8	6	5	4	3	2	1	0	−1	−2	−3	−5	−6	−7
10	126.0–127.9	10	9	7	6	5	4	3	2	1	0	−1	−2	−3	−5	−6	−7	−8	−9
	128.0–137.9	10	9	8	7	6	5	4	2	1	0	−1	−2	−3	−4	−5	−6	−7	−8
	138.0–147.9	11	10	9	8	6	5	4	3	2	1	0	−1	−2	−3	−4	−5	−7	−8
	148.0–156.9	12	10	9	8	7	6	5	4	3	2	1	0	−1	−3	−4	−5	−6	−7
11	130.0–133.9	10	9	8	6	5	4	3	2	1	0	−1	−2	−3	−4	−6	−7	−8	−9
	134.0–143.9	10	9	8	7	6	5	4	3	1	0	−1	−2	−3	−4	−5	−6	−7	−8
	144.0–153.9	11	10	9	7	6	5	4	3	2	1	0	−1	−2	−3	−5	−6	−7	−8
	154.0–162.9	11	10	9	8	7	6	5	4	3	1	0	−1	−2	−3	−4	−5	−6	−7
12	134.0–139.9	10	9	8	7	6	5	3	2	1	0	−1	−3	−4	−5	−6	−7	−8	−10
	140.0–149.9	11	10	9	7	6	5	4	3	2	1	−1	−2	−3	−4	−6	−7	−8	−9
	150.0–159.9	12	10	9	8	7	6	5	3	2	1	0	−1	−3	−4	−5	−6	−7	−8
	160.0–168.9	12	11	10	9	8	6	5	4	3	2	0	−1	−2	−3	−4	−5	−7	−8
13	140.0–145.9	10	9	8	7	6	4	3	2	1	0	−1	−3	−4	−5	−6	−7	−8	−10
	146.0–155.9	11	10	9	7	6	5	4	3	2	0	−1	−2	−3	−4	−6	−7	−8	−9
	156.0–165.9	12	10	9	8	7	6	5	3	2	1	0	−1	−3	−4	−5	−6	−7	−8
	166.0–174.9	12	11	10	9	8	6	5	4	3	2	1	−1	−2	−3	−4	−5	−7	−8
14	146.0–149.9	10	9	8	6	5	4	3	2	1	0	−1	−3	−4	−5	−6	−7	−8	−9
	150.0–159.9	11	9	8	7	6	5	4	3	1	0	−1	−2	−3	−4	−5	−7	−8	−9
	160.0–169.9	11	10	9	8	7	6	5	3	2	1	0	−1	−2	−3	−5	−6	−7	−8
	170.0–178.9	12	11	10	9	8	6	5	4	3	2	1	0	−2	−3	−4	−5	−6	−7
15	146.0–151.9	10	9	8	7	5	4	3	2	1	−1	−2	−3	−4	−5	−6	−8	−9	−10
	152.0–161.9	11	10	9	7	6	5	4	3	1	0	−1	−2	−3	−4	−6	−7	−8	−9
	162.0–171.9	12	11	10	8	7	6	5	4	2	1	0	−1	−2	−4	−5	−6	−7	−8
	172.0–180.9	13	12	11	9	8	7	6	5	3	2	1	0	−1	−3	−4	−5	−6	−7
16	146.0–151.9	11	10	8	7	6	5	3	2	1	−1	−2	−3	−4	−6	−7	−8	−10	−11
	152.0–161.9	12	10	9	8	7	5	4	3	2	0	−1	−2	−4	−5	−6	−7	−9	−10
	162.0–171.9	13	12	10	9	8	6	5	4	3	1	0	−1	−3	−4	−5	−6	−8	−9
	172.0–180.9	14	13	11	10	9	7	6	5	4	2	1	0	−2	−3	−4	−5	−7	−8
17	148.0–153.9	11	10	9	7	6	5	3	2	1	0	−2	−3	−4	−6	−7	−8	−10	−11
	154.0–163.9	12	11	10	8	7	6	4	3	2	0	−1	−2	−4	−5	−6	−8	−9	−10
	164.0–173.9	13	12	11	9	8	7	5	4	3	1	0	−1	−3	−4	−5	−6	−8	−9
	174.0–182.9	14	13	12	10	9	8	6	5	4	2	1	0	−1	3	−4	−5	−7	−8
18	148.0–149.9	10	9	8	7	5	4	3	2	1	−1	−2	−3	−4	−6	−7	−8	−9	−10
	150.0–159.9	11	10	8	7	6	5	4	2	1	0	−1	−3	−4	−5	−6	−7	−9	−10
	160.0–169.9	12	11	9	8	7	6	4	3	2	1	0	−2	−3	−4	−5	−6	−8	−9
	170.0–178.9	13	11	10	9	8	7	5	4	3	2	1	−1	−2	−3	−4	−5	−7	−8

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IX. Citations

1. Jones KL, Smith DW. Recognition of the fetal alcohol syndrome in early infancy. Lancet 2:999-1001, 1973.

2. Clarren SK, Smith DW. Fetal alcohol syndrome. New Engl J Med 298:1063-1067, 1978.

3. Sokol RJ, Clarren SK. Guidelines for use of terminology describing the impact of prenatal alcohol on the offspring. Alcoholism: Clinical and Experimental Research, 13 (4):597-598;1989.

4. Institute of Medicine (U.S.). Fetal Alcohol Syndrome: Diagnosis, Epidemiology, Prevention, and Treatment. Washington D.C.: National Academy Press, 1996.

5. Streissguth A and Kanton J (Eds.). The Challenge of Fetal Alcohol Syndrome: Overcoming Secondary Disabilities. Seattle, University of Washington Press, 1997.

6. Rosett HL. A clinical perspective of the fetal alcohol syndrome. Alcohol Clin Exp Res 4:118, 1980.

7. CDC. Update: Trends in fetal alcohol syndrome-United States, 1979-1993. MMWR 1995;44(13):249-251.

8. CDC. Birth certificates as a source for fetal alcohol syndrome case ascertainment-Georgia, 1989-1992. MMWR 1995a;44(13):251-253.

9. CDC. Use of international classification of diseases coding to identify fetal alcohol syndrome-Indian Health Service facilities, 1981-1992. MMWR 1995b;44(13):253 – 255.

10. Cordero JF, Floyd RL, Martin ML, Davis M, Hymbaugh K. Tracking the prevalence of FAS. Alcohol Health Res World 1994;18:82-85.

11. Alaska Department of Health and Social Services. Fetal Alcohol Syndrome, Prevalence, Risk Factors, Prevention. State of Alaska Epidemiology Bulletin. 1997;1(2):1-27.

12. Astley SJ, Clarren SK. A case definition and photographic screening tool for the facial phenotype of fetal alcohol syndrome. J. Pediatrics 1996;129:33-41.

13. Aase JM, Jones KL, Clarren SK. Do we need the term “FAE”? Pediatrics 1995;95(3):428-430.

14. Coggins TE, Friet T, Morgan T, Wikstrom M: *Washington State FAS DPN: Communicative Behavior Assessment.* Seattle, WA: University of Washington Publication Services, 1998

15. Coggins TE, Friet T, Morgan T. Analyzing narrative productions in older school-age children and adolescents with FAS: An experimental tool for clinical application. Clin Ling Phon 1998;12: 221 - 236.

16. Farkas, Leslie. Anthropometry of the Head and Face. 2nd Edition. Raven Press, New York, pp. 405 1994.

17. Fetal Alcohol Syndrome-Tutor™ CD ROM. An interactive tutorial that assists medical professionals with the screening and diagnosis of FAS. Astley SJ, Clarren SK, Orkand A, Gratzer M, Astion M. University of Washington Departments of Laboratory Medicine, Pediatrics and Epidemiology; March of Dimes Birth Defects Foundation, 1999.

18. Hall JG, Froster-Iskenius UG, Allanson JE. Handbook of Normal Physical Measurements. Oxford University Press, pp. 504, 1989.

19. Astley SJ, Magnuson SI, Omnel L, Clarren SK. Fetal alcohol syndrome: Changes in craniofacial form with age, cognition, and timing of ethanol exposure in the Macaque. Teratology 1999;59:163-172.

20 Pryor, HB, Thelander H. Abnormally small head size and intellect in children. J Pediatrics, 1968;73:593-598.

21. Nellhaus G., Composite International & Interracial Graphs, Pediatrics 1988;41:106. Head Circumference, Girls and Boys, Birth to 18 Years, Distributed free by Mead Johnson & Company.

22. Ross Laboratories. Birth to 36 Months Physical Growth NCHS Percentiles, Boys and Girls, 1992, Ross Products Division, Abbott Laboratories, Columbus Ohio, 43216.

23. Ross Laboratories. 2 to 18 Years Physical Growth NCHS Percentiles, Boys and Girls, 1994, Ross Products Division, Abbott Laboratories, Columbus Ohio, 43216.

24. Ross Laboratories. Ross Growth & Development Program. Parent-Specific Adjustments for Evaluation of Length and Stature- Boys and Girls, 1983, Ross Products Division, Abbott Laboratories, Columbus Ohio, 43216.

X. Appendices

A. New Patient Information Form

B. FAS-Tutor™ CD-ROM

New Patient Information Form — FAS Clinic

Office Use: Date received 1 ___/___/___ Deadline ___/___/___ ASAP ___ Response Let. 4 ___/___/___ Photo 5 ___ Screen Code 6 _____
G _____ F _____ B _____ A _____ M _____ : 1 2 3 4

Patient Identification

Patient's Social Security Number *(optional)* 7 _____ 8 ☐ Female ☐ Male Race 9 _____

Patient's Name _____ Birth date 13 _____ Age 14 _____
First 10 *Middle* 11 *Last* 12

Patient's Address _____

City 16 _____ County 17 _____ State 18 _____ zipcode 19 _____

Patient's Telephone Home ( ) _____ Work ( ) _____

Caretaker Identification

Name of patient's primary caretaker(s) _____

Relationship to patient: 23 ☐ birth, ☐ adoptive, or ☐ foster parent ☐ other (specify 24 _____)

Caretaker's Address _____

City _____ County _____ State _____ zipcode _____

Telephone Home ( ) _____ Work ( ) _____

Name of patient's legal guardian(s) _____

Person Completing the Form

Name of person completing this form _____ Date _____

Relationship to patient: 35 ☐ birth, ☐ adoptive, or ☐ foster parent, ☐ caseworker, ☐ medical care provider

☐ other relationship (please specify 36 _____)

Referred by (e.g., who or what organization told you about the clinic ?) 37 _____

Who Should Correspondence be Sent To?

Name _____

Relationship to patient: ☐ birth, ☐ adoptive, or ☐ foster parent ☐ other (specify _____)

Address _____

City _____ County _____ State _____ zipcode _____

Telephone Home ( ) _____ Work ( ) _____

Please complete this form to the best of your ability. We realize you will not have the answers to all questions. All of the information requested on this form is important in allowing us to provide you with the most accurate diagnosis and most appropriate referrals for care. Thankyou for taking the time to complete it.

Reasons for Evaluation « What are the patient's primary problems? Please be specific.

What do you hope to gain from the evaluation?

Growth

Birth Measures

1. Birth weight: lbs / oz _____ or gms 51 _____

   Birth length: inches _____ or cm 53 _____

   Birth head circumference: inches _____ or cm 55 _____

   Gestational age *(length of pregnancy)*: weeks 56 _____ or months _____

Please provide additional height, weight and head measures if available*

2. Date _____ Weight: lbs _____ or kg _____

   Age _____ Height: inches _____ or cm _____

   Head Circumference: inches _____ or cm _____

3. Date _____ Weight: lbs _____ or kg _____

   Age _____ Height: inches _____ or cm _____

   Head Circumference: inches _____ or cm _____

4. Date _____ Weight: lbs _____ or kg _____

   Age _____ Height: inches _____ or cm _____

   Head Circumference: inches _____ or cm _____

5. Date _____ Weight: lbs _____ or kg _____

   Age _____ Height: inches _____ or cm _____

   Head Circumference: inches _____ or cm _____

Birth Parents' Heights: Birth Mother: inches _____ or cm 91 _____

Birth Father: inches _____ or cm 93 _____

* This information may be available from the patient's physician or school nurse. If growth charts are available and can be photocopied and attached to this form, you need not fill out this section.

Physical Appearance and Health

1. **Photographs of the patient's face are very helpful to us.** The most helpful show the patient's full face towards the camera in good light without much facial expression (no big smile or frown). Pictures between ages 1 and 12 years are best.

   - Are such photographs available? ____ yes ____ no
   - Are one or two included with this form? ____ yes ____ no
   - Can others be brought to the clinic? ____ yes ____ no

Please staple photo(s) here:

Photo may be bigger than this space

2. **Was the patient born with (or later discovered to have) any birth defects (things like cleft lip, congenital heart defects, club foot, etc.)?** 97 ____ yes ____ no ____ unknown

   If yes, please describe: 98 _____

3. **Has this patient ever had:**

	yes	no	unknown		yes	no	unknown
Allergies	99 ____	____	____	Chronic illness of the heart	104 ____	____	____
Multiple ear infections	100 ____	____	____	Chronic illness of the kidneys	105 ____	____	____
Chronic sinusitis	101 ____	____	____	Chronic illness of the joints/limbs	106 ____	____	____
Chronic hearing loss	102 ____	____	____	Chronic illness of the stomach/ bowels	107 ____	____	____
Visual problems (wears glasses)	103 ____	____	____				

4. **Has this patient ever had:**

   A. **Operations (since birth)** 108 ____ yes ____ no ____ unknown

Describe Operation	Surgeon's Name	Patient's Age

   B. **Any other hospitalizations** 115 ____ yes ____ no ____ unknown

Reason for Hospitalization	Hospital/Doctor	Patient's Age

   C. **Physical abuse** 122 ____ yes ____ no ____ unknown Age(s): 123 _____

   Was this evaluated by a physician? ____ yes ____ no ____ unknown

   D. **Sexual abuse** 125 ____ yes ____ no ____ unknown Age(s): 126 _____

   Was this evaluated by a physician? ____ yes ____ no ____ unknown

Neurologic Issues

1. Has this patient ever had:

A. Seizures

128 ____ yes ____ no ____ unknown

Type: 129 _____

Age when seizure(s) started: 130 _____

Name(s) of medication(s) given? 131 _____

B. Loss of specific motor skills such as standing, walking, running, etc.

132 ____ yes ____ no ____ unknown

If yes, please describe _____

C. Bed wetting or soiling after 8 years of age.

134 ____ yes ____ no ____ unknown ____ not 8 years old yet

2. Has this patient ever had a head injury leading to unconsciousness or evaluation by a physician?

____ yes ____ no ____ unknown

If yes, please describe _____

3. Has the patient ever had a CT scan or MRI scan of the brain

137 ____ yes ____ no ____ unknown

If yes, was it described to be abnormal? 138 ____ yes ____ no ____ unknown

Attention Deficit and Hyperactivity

1. Has the patient ever been evaluated for attention deficit/hyperactivity disorder (ADD or ADHD)?

139 ____ yes ____ no ____ unknown

If yes:

When was the evaluation done? Age: _____ Date: _____

Was the patient diagnosed with ADD or ADHD? 142 ____ yes ____ no ____ unknown

Was the patient ever treated for ADD or ADHD? ____ yes ____ no ____ unknown

What medications have been tried?

Drug	Dose	Ages	Response
144			147

Mental Health Issues

1. Has the patient ever been evaluated by a psychiatrist, psychologist, or mental health counselor?

164 ____ yes ____ no ____ unknown

If yes, please list each psychiatrist, psychologist and/or counselor.

A. Type of professional: _____

Reason for assessment: _____

Type of therapy (i.e., behavioral, individual counseling, group counseling, family counseling, medicine): _____

_____

Age at the time of therapy: _____ Did the therapy help? ____ yes ____ no ____ unknown

If yes, how did it help? _____

_____

_____

B. Type of professional: _____

Reason for assessment: _____

Type of therapy (i.e., behavioral, individual counseling, group counseling, family counseling, medicine): _____

_____

Age at the time of therapy: _____ Did the therapy help? ____ yes ____ no ____ unknown

If yes, how did it help? _____

_____

_____

2. Has the patient ever been evaluated for mood problems (depression, anxiety, etc.) or phobia (fear)?

177 ____ yes ____ no ____ unknown

If yes:

When was the evaluation(s) done? Age(s): _____ Date(s): _____

What medications have been tried and how well did they work?

Drug	Dose	Response
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

School Issues

1. **List ALL schools the patient has attended and the grades of attendance:**

School	City	Grades Attended	Received Special Education, Resource Room, Tutoring, etc. yes	no	unknown
			196		

2. **What learning problems does the patient have?** 235

3. **What behavioral problems does the patient have?** 236

Alcohol Exposure

Please fill in this information as completely as possible.
This information is critical to the evaluation of the patient.

Alcohol use by the birth mother

- **Before pregnancy:** average number of drinks per drinking occasion: 237_____
  maximum number of drinks per occasion: 238_____
  average number of drinking days per week: 239_____
  Type(s) of alcohol consumed: 244 ___wine, ___beer, ___ liquor, ___ unknown, ___ other (specify _____

- **During pregnancy:** average number of drinks per drinking occasion: 241_____
  maximum number of drinks per occasion: 242_____
  average number of drinking days per week: 243_____
  Type(s) of alcohol consumed: 244 ___wine, ___beer, ___ liquor, ___ unknown, ___ other (specify _____

Which trimester(s) did the mother drink alcohol? 245 _____ 1st _____ 2nd _____ 3rd _____ unknown

		No	Yes	Unknown
Was the birth mother ever diagnosed with alcoholism?	246	_____	_____	_____
Was the birth mother ever reported to have a problem with alcohol?	247	_____	_____	_____
Did the birth mother ever receive treatment for alcohol addiction?	248	_____	_____	_____

If the above information is unknown, please provide any information that might help describe the mother's level of alcohol use before and during pregnancy 249 _____

_____

_____

_____

Did the birth mother use any of the following substances during pregnancy?

Yes	No	Unknown	Type	Please List Specific Substance(s)	Month(s) of Pregnancy
250___	___	___	Drugs	251 _____	_____
254___	___	___	Tobacco	_____	_____
257___	___	___	Medications	258 _____	_____
___	___	___	X-rays	_____	_____

Information about the Patient's Biological Parents

Birth mother's name_____ Birth date 266 _____
First$_{263}$ Middle$_{264}$ Last$_{265}$

Mother's Race 267 ❑ white ❑ black ❑ American Indian ❑ Alaskan Native ❑ Hispanic
❑ Asian ❑ unknown ❑ other (specify) _____

Education level attained (last year of school completed) 269 _____ Age at birth of patient 270 _____

Does she have a history of learning problems? 271 _____

Birth mother's Address _____
Street City$_{273}$ State$_{274}$ Zip$_{275}$

When was the last contact with the birth mother? 276 _____

Birth father's name_____ Birth date 280 _____
First$_{277}$ Middle$_{278}$ Last$_{279}$

Father's Race 281 ❑ white ❑ black ❑ American Indian ❑ Alaskan Native ❑ Hispanic
❑ Asian ❑ unknown ❑ other (specify) _____

Education level attained (last year of school completed) 283 _____ Age at birth of patient 284 _____

Does he have a history of learning problems? 285 _____

When was the last contact with the birth father? 286 _____

Medical History of the Biological Family

Has anyone in this patient's biological family ever had any of the following conditions? *Check all that apply.*

		Birth Mother	Birth Father	Mother's Family	Father's Family	Siblings of patient
Alcoholism	287					
Birth Defects	288					
Stillbirths	289					
Miscarriages	290					
Mental retardation	291					
Other developmental disabilities	292					
Learning disorders	293					
Attention deficit	294					
Hyperactivity	295					
Epilepsy	296					
Neurologic disease	297					
Child abuse	298					
Sexual abuse	299					
Depression	300					
Suicide	301					
Mental illness	302					
Vision problems	303					
Hearing problems	304					
Chronic illnesses	305					
Tourette syndrome	306					
Delinquency	307					
Any specific genetic condition	308					
Other	309					

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Pregnancies of Birth Mother

1. Please list **all** of the birth mother's pregnancies including miscarriages, abortions, in the order of their occurrence:

Year	Length of Pregnancy	First name of child if applicable	Live born Child yes	Live born Child no	Normally Developed yes	Normally Developed no	If not "normally" developed, please explain *Include FAS / FAE diagnosis, if known*

Office Use:	402 Total Parity	403 Total Gravitity	404 Patient Parity	405 Patient Gravitity	406 FAS/FAE diagnoses

Pregnancy, Labor, and Delivery of this Patient

1. **Did the birth mother experience any difficulties during pregnancy?** 407 ___ Yes ___ No ___ Unknown

   If yes, please describe: _____

2. **Did the birth mother receive prenatal care?** 407a ___ Yes ___ No ___ Unknown
3. **Were there complications during the labor or delivery?** 409 ___ Yes ___ No ___ Unknown

   If yes, please explain: _____

4. **Was the delivery:** 411 _____ Natural _____ By C-section _____ Unknown

   Reason for C-Section, if performed _____

5. **Where was the patient born?** Hospital _____ City 414 _____ State 415 _____

6. **Apgar scores** 416 _____ at 5 minutes 417 _____ at 10 minutes

7. **How many days did the infant stay in the birth hospital?** 418 _____

8. **Did the patient have any of the following problems while still in the birth hospital?**

	Yes	No	Unknown		Yes	No	Unknown
Feeding problems	419 ___	___	___	Infections	422 ___	___	___
Apnea / breathing difficulties	420 ___	___	___	Jaundice	423 ___	___	___
Supplemental oxygen required	421 ___	___	___	Convulsions	424 ___	___	___

List of Professionals Currently Involved in Patient's Care

Primary Physician

Name: _____ Phone: _____

Address: _____

Other Physicians

Name: _____ Phone: _____

Specialty: _____

Address: _____

Name: _____ Phone: _____

Specialty: _____

Address: _____

Name: _____ Phone: _____

Specialty: _____

Address: _____

Mental Health Consultants *(includes Psychiatrists Psychologists, and Counselors)*

Name: _____ Phone: _____

Specialty: _____

Address: _____

Name: _____ Phone: _____

Specialty: _____

Address: _____

School

Name: _____ Phone: _____

Address: _____

Contact Person *(teacher, nurse, counselor, etc.)*: _____

_____

Other

Name: _____ Phone: _____

Profession: _____

Address: _____

Placements

1. List all of the placements the patient has had from birth through today.

Type of placement (i.e., foster, adoptive, etc.)	Duration of placement	Age of patient when placement started

Office Use:	456 Total	457 First	458 Last

A. How long has the patient been in your care? 459_____

What to bring to Clinic

If the patient has had any of the following assessments, please bring them to Clinic on the day of your appointment. This information is very important to the patient's diagnostic evaluation.

_____ Photographs of the patient from birth to 10 years of age, without a smile.

_____ Medical records which document the problems you have reported above.

_____ School Assessments including:
- Achievement tests
- IQ tests
- Language assessments
- Social Skills assessments
- Behavior assessments

_____ Psychological Assessments

_____ Developmental Assessments including:
- Motor Development (fine and gross motor)
- Occupational Therapy assessments
- Mental (cognitive) assessments

Appendix B.

FAS-Tutor^{TM} CD-ROM

A CD-ROM entitled *Fetal Alcohol Syndrome-Tutor*^{TM} is available to accompany this Diagnostic Guide for FAS and Related Conditions. The CD-ROM provides additional instruction for medical professionals, through video, computer animation and photographic examples, on how to screen and diagnose FAS. Fetal Alcohol Syndrome-Tutor was supported by the March of Dimes Birth Defects Foundation.

To learn more about the CD-ROM, contact the

FAS Diagnostic and Prevention Network
Children's Hospital and Regional Medical Center
4800 Sand Point Way NE, CH-47
Seattle, WA, 98105

http://depts.washington.edu/fasdpn