THE CHILD HEALTH MANUAL

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THE CHILD HEALTH MANUAL

PREFACE

This book grew out of our experiences in providing and teaching pediatric care to professionals on both sides of the Atlantic. The information needed to provide for the basic and common needs of children was not available in a single, easily transported volume. Dr. Macfarlane created an excellent guide of this sort, well-suited to the needs of the nurse visitors who provide a great deal of the care in England. We have now worked together, using his original and very concise format, to design a reference for the nurse-practitioner, family physician, intern and resident, as well as the pediatrician who care for children in the U.S. and elsewhere. We hope we have been able to make their jobs easier and perhaps to free some of the time and energy they would otherwise use to obtain information so that they can give children more attentive and unhurried care.

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CONTENTS

1 PREVENTION

1.1 SOCIOECONOMIC AND CULTURAL ASPECTS OF PREVENTION

The most important part of child health is caring for well children and protecting them from harm, and the most significant determinant of children's health is the environment in which they live. This is usually provided by the parents based on their socioeconomic circumstances within the context of their culture. That these factors play a vital role in health is demonstrated by differential morbidity and mortality rates in population groups across the United States. For example, mortality rates of Navajo, black American, and Mexican-American infants exceed those of white Americans (Harwood, 1981). Tuberculosis, disease caused by *Salmonella,* and hepatitis are more prevalent in the American-Chinese community than in the overall United States population. In Southeast Asian refugees, tuberculosis, intestinal parasites, and hepatitis A and B are common, and in addition, malaria and Hansen's disease (leprosy) have been reported (Pickwell, 1983).

It behooves the clinician (1) to identify the demographic, ethnic, and epidemiologic characteristics of the population with which he or she is working and (2) to explore the concepts of health, disease, illness, and the expectations of the health care system held by the specific patient population.

Medical services have a specific role to play in child health, ranging from prevention of death, illness, and handicap by providing appropriate family planning (see page 108), genetic counseling (see page 3), antenatal screening and care (see page 7), to, of course, emotional support. After birth, the major concerns of professionals caring for the health of children include prevention of infection by a program of immunizations (see page 34), early identification of pathology to prevent further suffering or handicap (see page 176), prevention of accidents (see page 8), and where possible, prevention of sudden infant death syndrome (SIDS) (see page 24), and child abuse (see page 29). Where such prevention is not possible, the aim should be to protect the child from further avoidable suffering.

COMMON CAUSES OF DEATH IN CHILDREN AT DIFFERENT AGES

- **Neonatal period**
  Complications of prematurity, including intraventricular hemorrhage
  Congenital abnormalities
  Infection

- **1—12 months**
  Sudden infant death syndrome
  Respiratory infection (pneumonia, etc.)
  Congenital abnormalities (heart disease, etc.)
  Accidents
- **1—4 years**
  Accidents
  Congenital abnormalities
  Respiratory disease
  Malignant neoplasms
- **5—14 years**
  Accidents
  Cancer
  Congenital abnormalities
  Homicide
- **15—24 years**
  Accidents
  Cancer
  Suicide
  Homicide

1.2 ANTENATAL AND PERINATAL PREVENTION OF DEATH AND HANDICAP

CONGENITAL ABNORMALITIES

The words inherited, hereditary, and genetic are used interchangeably to imply conditions that are dependent on genes for their expression. "Congenital" simply means present at birth and is not synonymous with "genetic." Genetic factors may or may not be primarily responsible for producing congenital malformations or abnormalities. For example, they are not responsible for the congenital malformations that result from the mother taking thalidomide during pregnancy. Systematic surveillance has demonstrated, however, that the occurrence of birth defects is substantially influenced by geographic and temporal variations.

"Familial" is used in connection with disorders that occur in aggregation within families but may not have been proved to have a purely genetic basis, for example, diabetes.

Genetic counseling involves advising parents of the risk of their having a baby with an inherited abnormality. It is usually performed by a specialist in genetics; however, physicians and child health workers should be aware of the basic information shown in the following tables.

RISK OF DOWN'S SYNDROME WITH INCREASING MATERNAL AGE

Maternal Age (yrs)	Risk of First Child Being Affected
15–19	1 in 1850
20–24	1 in 1600
25–29	1 in 1350
30–34	1 in 800
35–39	1 in 260
40–44	1 in 100
45–49	1 in 50

BIRTH FREQUENCIES OF SOME COMMON DOMINANT CONDITIONS IN THE UNITED STATES POPULATION (Per 1000 Live Births)

Huntington's chorea	0.5
Neurofibromatosis	0.3
Myotonic dystrophy (facioscapulo humeral dystrophy)	0.4
Polycystic disease of kidneys	4.0
Achondroplasia	0.1
Dominant forms of blindness	0.1
Dominant forms of early childhood-onset deafness	0.1
Dominant otosclerosis (adult-onset)	1.0
Monogenic hypercholesterolemia	10.0
Dentinogenesis imperfecta	8.0
Tuberous sclerosis	0.25
Waardenburg syndrome	0.25

BIRTH FREQUENCIES OF SOME COMMON RECESSIVE CONDITIONS IN THE UNITED STATES (per 1000 Live Births)

Cystic fibrosis	0.5
Phenylketonuria (classic)	0.1
Neurogenic muscle atrophies	0.1
Sickle cell anemia	0.1
Adrenal hyperplasia	0.1
Severe congenital deafness	0.2
Recessive forms of blindness	0.1
Nonspecific recessive forms of severe mental retardation (IQ $\leq$ 50)	0.5

INCREASE IN RISK OF CERTAIN MULTIFACTORIAL CONDITIONS WHEN FIRST-DEGREE RELATIVES ARE AFFECTED

	Incidence for General Population (%)	Incidence for First-degree Relative when One Individual Affected (%)	Incidence for First-degree Relative when Two First-degree Relatives Affected (%)
Common congenital defects			
Cleft lip and/or palate	0.1	2–5	9
Club foot	0.1	2–5	10–25
Congenital heart disease	0.5	2–5	10–25
Mental retardation (IQ < 70)	2	6	10–20
Myelodysplasia (anencephaly, spina bifida, meningomyelocele)	0.2	2–6	10
Congenital dislocation of hip	0.2 in girls 0.025 in boys	5 in girls 0.8 in boys	
Common diseases of postnatal life			
Allergies	18	40	
Cancer	5	5–100	
Diabetes	1–5	5–15	10–40
Hypertension	4–20	20–100	
Schizophrenia	1	7–15	40
Seizures	0.5	3.5	10–15

BIRTH FREQUENCIES IN MALES OF SOME COMMON SEX-LINKED RECESSIVE CONDITIONS IN EUROPEAN-DERIVED POPULATIONS (Per 1000 Live Births)

Duchenne's muscular dystrophy	0.2
Hemophilia (classic)	0.1
Ichthyosis (X-linked form)	0.1
Nonspecific X-linked forms of mental retardation	0.1

DRUGS CAUSING DEFORMITIES OF THE FETUS

Drug	Possible Effects
Alcohol (in large amounts)	Fetal alcohol syndrome: slow growth, mental deficiency, facial abnormalities
Androgens and estrogens	Virilization in female fetus; neoplasm in vagina (not manifest until adolescence)
Antineoplastic drugs	Deformities
Antithyroid drugs	Goiter, hypothyroidism
Chloroquine	Deafness, corneal opacities
Corticosteroids	Adrenal atrophy
Cortisone	Cleft palate
Fertility drugs	Chromosomal aberrations
Folic acid antagonists (methotrexate, aminopterin)	Generalized deformities
Rifampin	Neural tube defect
Streptomycin	Deafness
Sulfonylureas	Hypoglycemia
Tetracycline	Discoloration of teeth
Thalidomide (no longer used)	Phocomelia
Coumadin	Nasal bone hypoplasia

No drugs should be given to pregnant women unless absolutely necessary. If in doubt whether a drug has an adverse effect, one should seek advice, ideally from a hospital pharmacologist.

DRUGS GIVEN TO MOTHERS THAT AFFECT THEIR NEWBORNS

Drug	Effects
Alcohol	Acute withdrawal and state mimicking delerium tremens
Aspirin	Thrombocytopenia; lowered factor XII
Benzodiazepine tranquilizers	Apnea, hypothermia, hypertonia, withdrawal
Beta-adrenergic stimulants	Arrhythmias
Beta-adrenergic antagonists	Hypoglycemia, bradycardia
Coumadin	Hemorrhage

Drug	Effects
Indomethacin	Primary pulmonary hypertension
Lithium	Lethargy, hypotonia, cyanosis
Magnesium sulfate, antieclampsia doses	Hypotonia, respiratory depression, withdrawal
Narcotic analgesics (addiction)	Withdrawal
Oxytocin	Hemolysis, possible jaundice
Phenobarbitol	Withdrawal, hemorrhagic disease of the newborn
Phenytoin	Hemorrhagic disease of the newborn
Procaine analogs (local anesthetics)	Neonatal depression; bradycardia
Primidone (Mysoline)	Hemorrhagic disease of the newborn
Sulfonamides	Hyperbilirubinemia, kernicterus; hemolysis in G6PD deficiency
Thyroid suppressants (propylthiouracil, methimazole)	Hypothyroidism, possible goiter
Vitamin K (water-soluble)	Hyperbilirubinemia, possible kernicterus

ANTENATAL AND POSTNATAL SCREENING FOR CONGENITAL ABNORMALITIES

More than 30 congenital abnormalities can be diagnosed through prenatal testing. Many of these tests are only performed where there is a high risk of a child having a rare abnormality, and routine screening is impractical. Common tests are listed as follows:

DISEASES THAT ARE READILY DIAGNOSED ANTENATALLY

Abnormality	Test	Optimal Timing of Test
Anencephaly and spina bifida (myelodysplasia)	Alpha-fetoprotein level in blood, followed if necessary by an amniocentesis*	14–18 wks after conception
Congenital rubella**	Blood test for antibodies	If contact or disease suspected, specific tests to show rise in antibody levels
Down's syndrome (in mothers 35–40 years old)	Amniocentesis*	14–18 wks after conception
Rhesus isoimmunization	Blood tests for antibodies	At regular intervals during pregnancy if suspected
Sex-linked inherited diseases (where specific indications)	Amniocentesis*	14–18 wks after conception
Syphilis**	Routine blood test	Earliest opportunity

Abnormality	Test	Optimal Timing of Test
Toxoplasmosis**	Blood test for antibodies (in endemic areas only)	At first prenatal visit and later to check rising antibody levels
Cytomegalovirus** infection	Blood test for antibodies	If disease suspected
Herpes simplex**	Blood test for antibodies	If disease suspected

*Amniocentesis is a complicated procedure that causes spontaneous abortion in about 1 in 100, and therefore is only carried out when there are specific indications. Chorionic villus biopsy is a new procedure that provides the same information earlier in pregnancy. Its safety is not yet established.

**Toxoplasmosis, rubella, cytomegalovirus, and herpes antibodies (plus syphilis, usually) are often collectively tested in a screen.

The number of screening tests performed on newborn babies for inborn errors of metabolism and other abnormalities varies from one area to another, according to research interests and laboratory facilities. Below are two that are commonly performed in the United States.

TESTS FREQUENTLY PERFORMED POSTNATALLY TO DETECT COMMON ABNORMALITIES

Abnormality	Test	Timing of Test
	Routine in All Areas	
Phenylketonuria (incidence 1:10,000)	Guthrie test or fluorometric method on blood, usually taken from heel prick	2–7 d after birth
Congenital hypothyroidism (incidence 1:3500)	Test for T^4 or thyroid-stimulating hormone done on same sample of blood taken for Guthrie	1–7 d after birth

1.3 ACCIDENTS

Accidents are the most common cause of death in children and adolescents. Overall, the most frequent fatality involves being hit by a motor vehicle; in the home it is fire.

Outlined below are causes of death that are common at various ages. Many accidents can be prevented by taking common-sense precautions, depending on the age of the child. Suggested advice to parents is outlined on page 10.

CAUSES OF DEATH FROM ACCIDENTS IN CHILDREN UNDER 1 YEAR OF AGE*
(Death rate 31.5 per 100,000 population in this age group)

Cause	Percentage
Aspiration of food or object**	24
Motor vehicle	21
Mechanical suffocation	17
Fires, burns	12
Drowning	7
Other	19

CAUSES OF DEATH FROM ACCIDENTS IN CHILDREN 1–4 YEARS OF AGE*
(Death rate 26.5 per 100,000 population in this age group)

Cause	Percentage
Motor vehicle	37
Fires, burns	21
Drowning	21
Aspiration of food or object**	5
Falls	3
Other	13

CAUSES OF DEATH FROM ACCIDENTS IN CHILDREN AGE 5–14 YEARS*
(Death rate 16 per 100,000 population in this age group)

Cause	Percentage
Motor vehicle	52
Drowning	16
Fires, burns	10
Firearms	6
Other	16

CAUSES OF DEATH FROM ACCIDENTS IN YOUTHS 15–24 YEARS OF AGE*
(Death rate 63 per 100,000 population in this age group)

Cause	Percentage
Motor vehicle	73
Drowning	8
Firearms	3
Poisons	2
Other	14

*All data derived from *Accident Facts,* National Safety Council, 1983.

**Hot dogs, candy, nuts, and grapes account for about 40% of choking deaths, with hot dogs alone accounting for 17%. In infants under 1 year, hot dogs, pieces of apple, and cookies cause half the asphyxiations.

SAFETY ADVICE FOR PARENTS

Safety advice is an important part of health education. All pediatric health professionals should be aware of these important points and communicate them to parents.

IN LIVING ROOMS

- Small children may bite electric cords, causing burns on mouth and face.
- Examine toys for loose buttons and eyes that may come off and be swallowed, and for sharp edges that could cut.
- Put out of sight small objects that can be swallowed or put into ears and noses.
- Do not put a mirror over the fireplace: clothes can catch fire when the child comes close to look into it.
- Keep scissors, pins, and needles well out of reach.
- Put electric cords where they will not be tripped over, but not under carpets.
- Replace worn or frayed cords promptly.
- Do not leave the back off the television or block the ventilation holes.
- Keep plastic bags, including record sleeves, away from children.
- Do not leave windows open without a safety catch.
- Use a child guard screen around fireplaces, wood stoves, and gas heaters.
- Use safety plugs in electric outlets.
- Anchor electrical cords every six inches with insulated staples.

IN BEDROOMS AND HALLS

- Use safety glass in glass doors.
- A pacifier on a cord or ribbon around baby's neck can become entangled and strangle a baby.
- Crib slats should be no more than 2⅜ inches apart.
- The drop side of the crib should be secured by a locking latch that cannot be reached by the child.
- A firm mattress, without plastic cover, should fit snugly against the crib.
- Cribs should not be placed against a window.
- No stringlike or ropelike object or device in which the child can become entangled should be in the crib or within reach.
- All painted surfaces should be free of lead paint.
- Children should be dressed in flame-retardant sleepwear.
- Never leave small children alone in the house.