Chapter 8
Drug Administration Throughout the Lifespan

Growth—Progressive Increase in Physical Size
- Stages of growth and physical development
- Predictable sequence

Development Refers to Functional Changes in
- Physical, psychomotor, and cognitive capabilities
  - Psychomotor and cognitive development variable

Nursing Considerations
- Individuality of clients
- Age, growth, and development of clients
- Relationship to pharmacokinetics and pharmacodynamics

Providing Optimum Care
- Understand normal growth and development
- Recognize deviations from the norm
- Address health-pattern impairments

Five Pregnancy Categories of Drugs
- Developed by FDA
- Categories—A, B, C, D, X
- Teratogens
<table>
<thead>
<tr>
<th>Pregnancy Category A Drugs</th>
<th>Pregnancy Category B Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Studies performed with pregnant women</td>
<td>• Animal studies have shown no risk to fetus</td>
</tr>
<tr>
<td>• No increased risk of fetal abnormalities shown</td>
<td>• No studies done with pregnant women</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnancy Category C Drugs</th>
<th>Pregnancy Category D Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Animal studies have shown a risk to fetus</td>
<td>• Risk to fetus shown</td>
</tr>
<tr>
<td>• No studies done with pregnant women</td>
<td>• Benefits outweigh risk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnancy Category X Drugs—Contraindicated</th>
<th>Drugs and Other Substances in Breast Milk Can Cause Adverse Effects to the Infant</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Studies done with animals or pregnant women</td>
<td>• Prescription and OTC drugs</td>
</tr>
<tr>
<td>• Fetal abnormalities shown</td>
<td>• Illicit drugs</td>
</tr>
<tr>
<td></td>
<td>• Alcohol and tobacco</td>
</tr>
<tr>
<td></td>
<td>• Herbal products</td>
</tr>
<tr>
<td></td>
<td>• Same guidelines as during pregnancy</td>
</tr>
</tbody>
</table>
American Academy of Pediatrics (AAP) Committee on Drugs

- Recommends drugs to be avoided during lactation
  - atenolol
  - lithium
  - amphetamines
  - Cocaine

Five Pregnancy Categories of Drugs

**TABLE 6.1**

<table>
<thead>
<tr>
<th>Category</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alopurinol, clofibric acid, cyclosporine, demeclocycline, procainamide, thiazide diuretics, trimethoprim, zidovudine</td>
</tr>
<tr>
<td>B</td>
<td>Captopril, enalapril, hydralazine, methyldopa, norepinephrine, propranolol, quinapril, verapamil</td>
</tr>
<tr>
<td>C</td>
<td>Amphetamines, atenolol, lithium, cocaine, cocaine metabolites</td>
</tr>
<tr>
<td>D</td>
<td>None</td>
</tr>
<tr>
<td>E</td>
<td>None</td>
</tr>
</tbody>
</table>

Five Pregnancy Categories of Drugs (continued)

- Diminished gastric motility
- Decreased blood flow to digestive organs
- Increased gastric pH

Absorption of Drugs Slower in Older Adults

- Diminished gastric motility
- Decreased blood flow to digestive organs
- Increased gastric pH

Distribution Diminished in Older Adults

- Increased body fat
- Reduced plasma level
- Less body water

Distribution Diminished in Older Adults (continued)

- Liver produces less albumin
  - Decreased plasma protein–binding ability
  - Increased levels of free drugs
  - Increases potential for drug-drug interaction
- Decreased cardiac output
Metabolism Reduced in Older Adults

- Decreased production of liver enzymes
- Liver mass decreases
- Splanchnic blood flow decreases
- Reduced first-pass metabolism
- Increases half-life of many drugs
- Prolongs and intensifies drug response

Excretion Reduced in Older Adults

- Reduced renal blood flow
- Reduced glomerular filtration rate
- Decreased active tubular secretion
- Decreased nephron function

Prenatal Stage and Pharmacotherapy

- Only when benefits to mother outweigh potential risks to fetus

Infants and Pharmacotherapy

- Safety of child is primary
- Educate lactating mother
- Educate parents about drug administration
Toddlers and Pharmacotherapy

- Short, concise explanations
- Provide comfort
- Oral drug administration

Preschoolers and Pharmacotherapy

- Can begin to assist with medications
- Mix oral drugs with food or flavored beverages

School-Age Children and Pharmacotherapy

- Offer longer, more detailed explanations
- Praise cooperation
- Offer choices when appropriate

Adolescents and Pharmacotherapy

- Need understanding and respect
- Educate about hazards of tobacco and substance abuse
- Provide important medication information
- Allow time for questions
Young Adults and Pharmacotherapy

• Positive medication compliance
• Educate about substance abuse and treatment of sexually transmitted diseases

Middle-Aged Adults and Pharmacotherapy

• Prescribed drugs for stress-related illnesses
• Numerous life transitions
• Positive lifestyle changes could prevent drug therapy

Illnesses Requiring Drug Therapy for Middle-Aged Adults

• Cardiovascular disease
• Hypertension
• Diabetes
• Cancer

Older Adults and Pharmacotherapy

• Take more medications (polypharmacy)
• More adverse drug events
• Accommodate for changes in physiologic and biochemical functions