Adolescent Therapeutics Working Group Presentation

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Adolescent Therapeutics Introduction

Adolescence (noun, 15th century)

Pronunciation: \a-də-ˈle-sən(t)s

1. **the state or process of growing up**
2. **the period of life from puberty to maturity terminating legally at the age of majority**
3. **a stage of development (as of a language or culture) prior to maturity**

Adolescent Therapeutics

- **Population**
- **Care providers**
- **Conditions**
  - Puberty
  - Disease

Adolescent Therapeutics Population

- **Individuals between 10-24 years represent**
  - 26.8% of total world population
  - 19.0% of the more developed (western) world
  - 28.5% of the less developed world
- **Individuals between 40-64 years represent**
  - 24.5% of total world population
  - 33.2% of the more developed (western) world
  - 22.5% of the less developed world

Adolescent Therapeutics

- **Population**
- **Care providers**
- **Conditions**
  - Puberty
  - Disease

Adolescent Therapeutics Care Providers

- **Concerns all specialists:**

Pediatrics	Gynecology
Internal Medicine	Surgery
Family Medicine	Pharmacology

- **Focus upon issues that affect adolescents**
- **Adolescent therapeutics can be defined by:**
  - Age (Typically 12-24 years of age)
  - Behavior (Risk and Prevention)
  - Specific Diseases and Developmental Stages

Adolescent Therapeutics

- **Population**
- **Care providers**
- **Conditions**
  - Puberty
  - Disease

Adolescent Therapeutics
Puberty

- Changes hormonal influence
- Changes body composition
- Changes in disease processes
- Changes in metabolism
- Changes in adherence

Adolescent Therapeutics Conditions

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- **Prevention**
  - Primary
  - Secondary
- **Treatment**
  - Acute conditions
  - Chronic conditions
- **Compliance**
- **Development**
  - Normal
  - Abnormal
  - Disease
- **Growth**
  - Height
  - Weight
  - Pubertal status
  - Hormonal status

Adolescent Therapeutics Conditions (partial list)

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- Acne
- Asthma
- Diabetes Mellitus
- Infectious Diseases
- Injuries
- Hypercholesterolemia
- Hypertension
- Menstrual Disorders
- Migraines
- Osteoporosis
- Pregnancy
- Obesity
- Depression
- Anxiety
- OCD
- Bipolar Disorder
- ADHD
- Substance Abuse

Adolescent Therapeutics Conditions – Obesity

- Ever increasing issue
- Changes in BMI (no change in Lean BMI)
- Changes in disease manifestation
- Changes in PK/PD

Adolescent Therapeutics Conditions – Diabetes

- Common chronic disease in children
- 176,500 people under the age of 20 (1:400-600 children with Type 1)
- Nearly 75% of newly diagnosed Type 1 diabetes < 18 years old
- Adolescents with newly diagnosed type 2 diabetes increased from < 5 % to 30 – 50%

Adolescent Therapeutics Priority 1

- **Understand the effects of both pubertal development and body weight on pharmacokinetics, pharmacodynamics, pharmacogenetics of pharmaceutical agents in children and adolescents**

Adolescent Therapeutics Priority 1

- With particular emphasis on understanding:
  - The effect of both stage of sexual maturity and body weight on drug distribution and metabolism
  - Pharmacogenetic changes in the expression of drug metabolizing enzymes in adolescents related to age, family history and pubertal maturation
  - Extent and mechanism, risk factors and consequences of weight gain seen in older children and adolescents treated with antipsychotics, parenteral contraceptives and other agents associated with weight gain
  - Impact of adherence on the pharmacotherapy and therapeutic outcome in adolescents since adolescents frequently are responsible for managing their own medications and treatments

Adolescent Therapeutics Study Design

- Systematic improvements
- Expertise development
- Comprehensive approach

Adolescent Therapeutics Study Design Considerations

- **Assent vs. Consent**
- **Regulatory Issues**
- **Pregnancy risk is always an issue**
- **Study design needs to take into account**
  - Dosage scaling
  - Developmental considerations
  - Pubertal staging
  - Intrusiveness/inconvenience

Adolescent Therapeutics Study Design Considerations

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- **Highly motivated study population**
- **Recruitment of additional participants**
- **Technically savvy**
  - e-diaries
  - text messages
  - cell phones
- **If they have a chronic disease – typically only one (decreased comorbid conditions)**
- **Honest (sometimes brutally honest)**
- **Adherence rates similar to adults**

Adolescent Therapeutics Priority 2

- **Develop a protocol across review divisions within FDA to evaluate the endocrine and metabolic, psychological, and reproductive impact of pharmacotherapy in adolescents (with particular emphasis on psychotropic and other drugs frequently used in adolescents)**

Adolescent Therapeutics Dosing Information

- Fit the individual
- Logically designed
- Carefully determined
- Eliminate errors

Adolescent Therapeutics Priority 3

- **Develop understanding of how and where to distinguish between pediatric (preadolescent) and adult dosing guidelines for all drugs used in adolescence.**

Adolescent Therapeutics Priority 3

- Determine when weight and/or age based dosing regimens are no longer applicable (e.g. When administering HIV drugs for a 12 year old who is at/or above adult weight or in a young adult who is significantly below adult weight)
- Determine whether development of the specific adolescent dosing guidelines needs to be considered for the therapeutic agents most commonly used within adolescents and young adults.

Adolescent Therapeutics Additional Thoughts

- **The Adolescent Therapeutics Working Group felt that adherence and adherence readiness of the adolescent as a key component of effectiveness for those drugs that demonstrate efficacy in the general adult populations.**

Adolescent Therapeutics Committee Members

- **Center for Drug Evaluation and Research U.S. Food And Drug Administration**
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- *Maria Trent, MD, MPH*
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- *Kathy Woodward, MD*
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- **Thank you for your time and attention**