Research Needed to Improve Drug Safety

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Urgent Safety Science Research Needs

- Drug toxicological research
- Predictive safety biomarkers
- Abuse potential
- Individualization of therapy for safety
- Large safety studies
- Safety in special populations
- Methodologic research for using large databases and health records
- Root cause of medication errors
- Effective risk communication

Toxicologic Research

- Ketamine
  - Long-marketed anesthetic agent
  - Published rodent studies: toxicity to developing brain
  - Need: primate developmental studies at relevant exposures
  - FDA: work with NTP, NIH to carry out
- Other examples
  - Chloral hydrate (carcinogenicity?)
  - Nano-scale products, e.g., sunscreens
  - Drugs in pregnancy; neonates

Predictive Safety Biomarkers

- Current safety tests are insensitive and often non-specific
- C-Path Institute (Tucson, AZ): Predictive Safety Consortium
  - 16-member pharmaceutical firm group
  - Share and cross-validate new assays on organ system basis
- Need additional research efforts on common drug toxicities (e.g. hepatotoxicity)

Individualization of Therapy

- Drug metabolizing enzymes
  - Slow metabolizers at risk for serious AEs
  - Genetic tests becoming available
  - Need outcome studies in people
  - Exploring consortia
- Varying target status
  - Many AEs result from individual sensitivity based on drug target status
- Make existing drugs much safer

Other Critical Research Needs

- Abuse potential
  - New method development needed
- Risk communication
  - Find AE—how to communicate effectively to change prescriber's behavior?
  - What is effective way to convey risk in drug ads, prescriber communications?
- Medication error root cause
  - Look/sound alike names
  - Mixups of various strengths
  - Other causes of use errors

Research Funding

- CDER funding approximately $500M (FY 07) includes generics program
- $240M User Fees (approximate)
- $225M Base Appropriations (approx)
- -$16M Orphan Drug grant program
- - infrastructure costs, salaries, document and adverse event processing, some rent
- Available dollars for the research needs outlined in preceding slides-- less than a few million

Bottom Line

- There is an acute need for scientific research to improve drug safety
- FDA generally not able to fund such studies (e.g., cost of certain large comparative safety studies could exceed entire appropriated CDER budget)
- Consortia, collaboration (e.g., NIH), CERTS, other mechanisms
- Gaps in knowledge are significant and ability to substantially improve overall safety of armamentarium is limited