Clinical Implementation of Pharmacogenomics

Mark Dunnenberger, PharmD, BCPS
Director of Pharmacogenomics
NorthShore University HealthSystem
Center for Personalized Medicine

Coordinates predictive/diagnostic and therapeutic services along with education & research

Molecular Pathology
- Tumor sequencing
- Hot spot NGS panel
- Microarray

Clinics
- Medical Genetics
- Oncology
- Pharmacogenomics
- Cardiology
- Neurology
- Diabetes

Systemic integration
- Pharmacogenomics
- Genomic results display

Education
- Physicians
- Nurses
- Pharmacists
- Employees
- Patients

Research
- Clinical Biorepository Translational
 Benefit with little to no toxicity

No therapeutic benefit

Adverse events and toxicities
Genetic testing can identify these patients before they take the medications

- Receive standard therapy
- Receive alternative therapy (i.e. different dose or medication)
Pharmacogenetics helps clinicians choose between therapeutic equals
Safer and more effective drug treatment
Increased adherence to drug therapy
Decreased hospitalizations
Decreased health care costs

- Safety
- Efficacy
- Compliance

- Admissions
- Expenses
Her CYP2C19 genotype is consistent with an increased risk of therapeutic failure with paroxetine. Please consider alternative therapies when initiating drug therapy to treat depression.
Pharmacogenetic translation process

Genotype
- Examples: rs16947 CT

Haplotype
- Examples: *1, *2, *3, *17

Diplotype
- Examples: *1/*1, *1/*2, *2/*2

Phenotype
- Example: poor metabolizer (PM)

Therapeutic Recommendation
- Examples: *1, *2, *3, *17
One Drug/One Gene CDS Decision Tree

Physician orders codeine

System looks for CYP2D6 test results

Yes

System looks for CYP2D6 high-risk result

Yes

Post-test CYP2D6 alert fires

No

No alert fires

Pre-test CYP2D6 alert fires

No
NorthShore Post-test Alert - 2

Best Practice Advisory - Stasinor, Pgx

ActX Genomic alert
Amitriptyline

Increased risk of side effects. Recommend decreasing dose.
Supporting Evidence: Strong  |  Patient Data Reliability: A  |  Genotype: CYP2C19*2 / CYP2C19*2

Additional Information

Remove the following orders?

Remove  |  Keep

Amitriptyline 100 MG PO Tab Disp-30 Tab. R-11, QHS starting 6/28/2016, E-Prescribing. Take 1 Tab by mouth every night at bedtime.

The following actions have been applied:

Sent: This advisory has been sent via In Basket

Acknowledge Reason

past t/e  recommended  interaction  OTHER

Accept
Amitriptyline

*Increased risk of side effects. Recommend decreasing dose.*
Supporting Evidence: Strong  Patient Data Reliability: A  Genotype: CYP2C19*2 / CYP2C19*2

Common brand names: domical, duo-vil, elavil, endep, etrafon, lentizol, limbitrol, triaval, vanatrip

Additional Information

Carisoprodol

*Increased risk of side effects. Recommend monitoring for toxicity.*
Supporting Evidence: Strong  Patient Data Reliability: A  Genotype: CYP2C19*2 / CYP2C19*2

Common brand names: arisoprodol, carisoma, soma, soma compound, soma compound with codeine, soprodal, vanadom
Need discrete, standardized data as a foundation for CDS!