

به نام حضرت دوست

2nd Tabriz Virtual (9 AM-12 PM)
Patient Safety and Medical Education
International Congress **tvpm** **zoom**



دومین کنگره بین المللی مجازی
ایمنی بیمار و آموزش پزشکی

۲۹ مهر لغایت ۳ آبان ۱۴۰۲

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Drug Interactions and Patients Safety

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What is a drug
interaction..?





What is a drug interaction..?

A drug interaction may be defined as:

- The phenomenon that occurs when the effects or pharmacokinetics of a drug are altered by prior administration or coadministration of a second drug.





What is a drug interaction..?

Some view drug- drug interactions as only a part of the larger phenomenon of drug interactions, which includes interaction of drugs with:

- **Foods**
- **Endogenous substances**
- **Herbals**
- **Laboratory tests**





Onset of Drug Interaction

- Rapid: within 24 hrs
- Delayed: days to weeks





Severity of Drug Interaction

- **Major** : life threatening or permanent damage (class I)
- **Moderate** : deterioration for pt's status (class II)
- **Minor** : bothersome or little effect (class III)



Severity of the drug interactions





Documentation of Drug Interaction

- The confidence that an interaction can occur. This evaluation is based on supporting biomedical literature.
- The documentation does not address the incidence or frequency of the interaction. It is also independent of the potential severity of the interaction.





Documentation of Drug Interaction

- **Established**: proven to occur in well controlled studies
- **Probable**: very likely, but not proven clinically
- **Suspected**: may occur; some good data, but needs more study
- **Possible**: could occur, but data are very limited
- **Unlikely**: doubtful, no good evidence of a clinical effect





Significance Rating

Summary of severity
and documentation



Significance Rating

Significance rating	Severity	Documentation
1	Major	Suspected or>
2	Moderate	Suspected or>
3	Minor	Suspected or>
4	Major/Moderate	Possible
5	Minor	Possible
5	Any	Unlikely





What' Your Opinion?

- Adrenaline+local anesthetics
- Metoclopramide+Anti-migraine drugs
- Levodopa+Benserazide
- Multiple therapy with anti hypertension drugs
- Multiple therapy with antibiotics





What's Your Opinion?

- 1) Normal Saline
- 2) Amp Gentamicin 80mg داخل سرم
- 3) Amp Ceftazidim 2g داخل سرم



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Classification of drug interaction

- Beneficial interactions
- Damaging interactions
- Drug interaction in the body
- Drug interaction out of the body



Mechanisms of drug interactions

- *Pharmacodynamic mechanisms*
- *Pharmacokinetic mechanisms*
- *Additive toxicity*





Pharmacokinetic mechanisms

Interaction with:

- Absorption
- Distribution
- Metabolism
- Elimination





What's Your Opinion?

- 1) Powder Cholestyramine
- 2) Tab Digoxin
- 3) Susp Al Mg S



What's Your Opinion?

1)

Cap Tetracycline



2)

*Cap
Multivitamin+Mineral*





Cytochrome P-450 System and Drug Interactions

Location: endoplasmic reticulum of hepatocytes, extrahepatic sites

Role: in phase I biotransformation reactions

Genetics:

- Families of CP-450 genes in mammals
- Nomenclature (IIIA4/ 3A4)
 - ✓ A roman/ arabic number to denote gene family
 - ✓ An upper case letter to designate a subfamily of highly related genes
 - ✓ Another arabic number to identifies the individual isoenzyme within the subfamily



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What's Your Opinion?

1) Tab Neoral

2) Tab Diltiazem



- 1) *Allopurinol*
- 2) *Methylprednisolone*
- 3) *Colchicin*
- 4) *Azathiopurine*





What's Your Opinion?

1) Tab Alprazolam

2) Grapefruit juice



Pharmacodynamic mechanisms

- **Additive or Synergistic interactions**
(more antihypertensive drugs)
- **Antagonistic interactions**
opioid & naloxon, BDZs & flumazenil
- **Interactions due to changes in drug transport mechanism** (clonidine & TCAs)
- **Interaction due to fluid/electrolyte imbalance**
Dig & thiazide diuretics
- **Indirect pharmacodynamic interactions**
MAOIs & indirect sympathomimetics





What' Your Opinion?

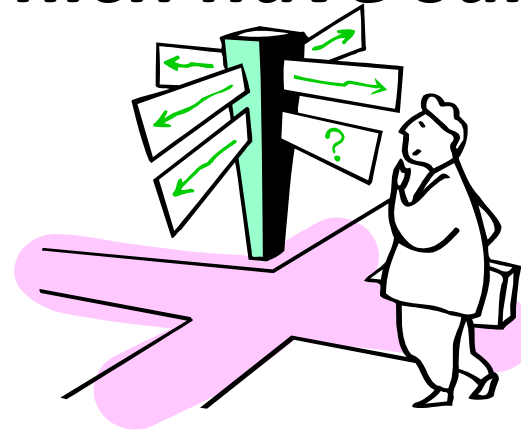
1) Cap Fluoxetine 20mg

2) Tab Tranylcypromine 10mg



Additive Toxicity

Use of 2 or more drugs which have same toxic effects on special system.



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What's Your Opinion?

1) Cap Gemfibrozil

2) Tab Lovastatin



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To Minimize The Risk of Combined Rx When There Is Potential For Pharmacokinetic Interaction

- ***A drug with less potential for drug interaction***
- ***Therapeutic drug monitoring***
- ***Judgment based on clinical observation***
- ***Dose adjustment***



Variability in Patients Response

- *Age*
- *Genetics*
- *Disease State*
- *Smoking*
- *Diet*
- *Alcohol Consumption*





Particularly Susceptible Patients

- *Elderly pts*
- *Pts with acute illness*
- *Pts with unstable disease*
- *Pts with renal/hepatic disease*
- *Pts with multiple prescribing physicians*



Conclusion

Knowledge of pharmacokinetics is important for optimal prescribing of drugs

Some populations require adjustment in dosing drugs

Understanding the principles that underlie and anticipate interactions



Life is Beauty

Thanks for your kind attention

