JADPRO CE Regional Education

From Inquiry to Investigation to Insight: Clinical Clarity in Non–Small Cell Lung Cancer

Identifying and Avoiding Drug Interactions

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- **Ms. Eaby-Sandy** has served as a consultant and on speakers bureaus for AstraZeneca, Helsinn, Merck, and Takeda.
- **Dr. Beardslee** has served as a consultant for AstraZeneca and Herron, and on the speakers bureau for AstraZeneca.
- **Dr. Davies** has served on speakers bureaus for AstraZeneca, Bristol-Myers Squibb, Genentech, and Merck.
- **Ms. Gilbert** has no conflicts of interest to disclose.
- **Ms. Persinger** has served on speakers bureaus for Genentech and Guardant Health, and on the advisory board for AstraZeneca.

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Learning Objective

- Manage drug–drug and drug–disease interactions in NSCLC

Outline

- Understand the metabolism and elimination of various compounds used to treat lung cancer
- Identify pertinent, common drug-drug interactions involving chemotherapy, targeted therapy, and immunotherapy used to treat lung cancer
- Avoid drug-disease interactions in treating lung cancer

Audience Response Question

The following statement is true about taking proton pump inhibitors (PPI) or H_2 blockers with EGFR tyrosine kinase inhibitors (TKIs):

A. It should be avoided at all costs due to potential to interfere with absorption

B. They should be spaced out by 12 hours to improve the absorption of the EGFR TKI

C. Patients who took PPIs or H_2 blockers with EGFR TKIs had decreased efficacy of the EGFR inhibitor on their cancer

D. There was little to no effect on the pharmacokinetics when giving a PPI or H_2 blocker with an EGFR TKI

E. Unsure

Audience Response Question

A 62-year-old female patient with NSCLC and h/o cardiac ischemia is to be treated with a 5HT-3 receptor antagonist. Which drug would you consider that would have the least risk of prolonging the QT interval?

A. Ondansetron
B. Palonosetron
C. Dolasetron
D. Unsure

Pharmacokinetics Basics

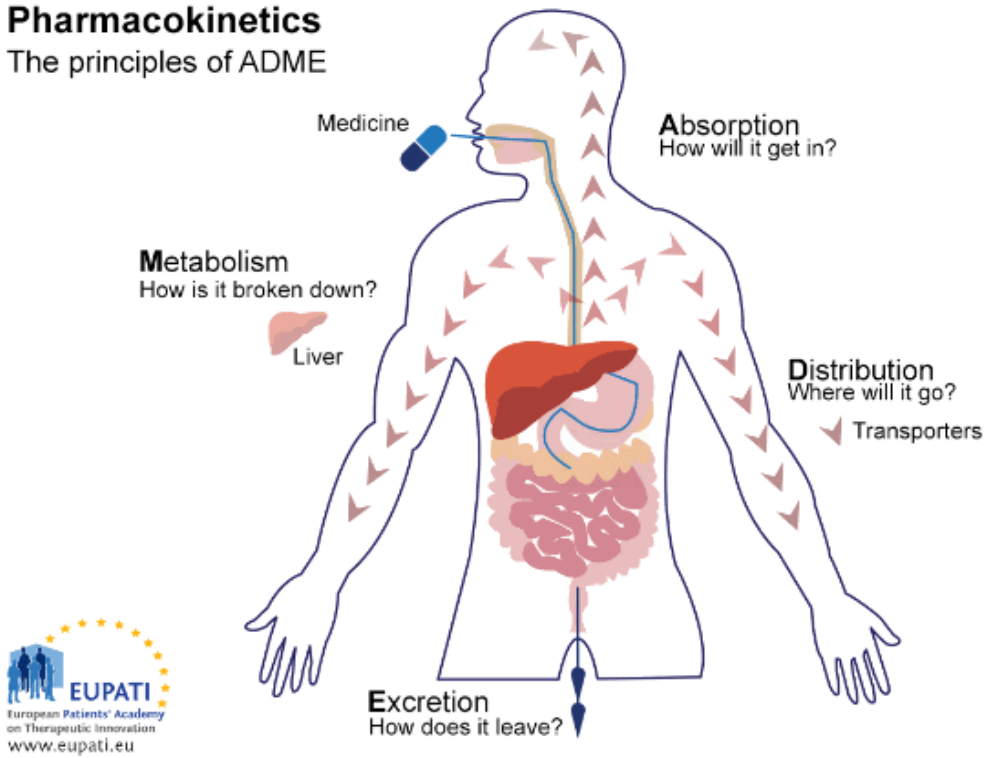

Fig. 1 - **ADME**

The key principles of Pharmacokinetics – the study of the effect the body has on a medicine – are represented in the acronym ADME.

Retrieved from https://www.eupati.eu/glossary/pharmacokinetics/

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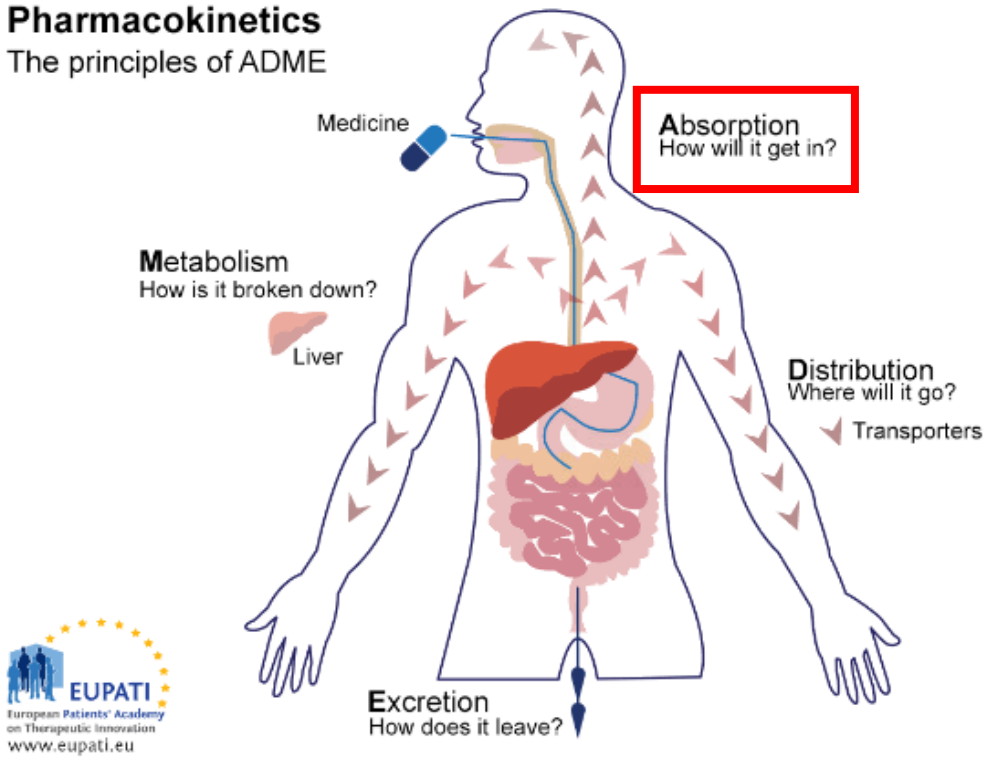
Oncology Therapy Pharmacokinetics: Generalizations

- Targeted therapy (EGFR, ALK, ROS1, BRAF V600E, NTRK, etc.)
  - Most are hepatically metabolized by CYP enzymes
  - CYP3A4 involved in metabolism of majority of targeted treatments
- Immunotherapy and other monoclonal antibodies
  - Not hepatically metabolized or renally excreted
  - Less drug-drug interactions
- Chemotherapy
  - Hepatically metabolized (e.g., paclitaxel)
  - Renally excreted (e.g., pemetrexed)
  - BOTH renal excretion and hepatic metabolism (e.g., etoposide)

Pharmacokinetics Basics (cont.)



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Retrieved from https://www.eupati.eu/glossary/pharmacokinetics/

EGFR in NSCLC

- 10% of NSCLC cases in North America
- 30%–50% of NSCLC cases in East Asia
- Higher incidence in women, non-smokers, adenocarcinoma histology

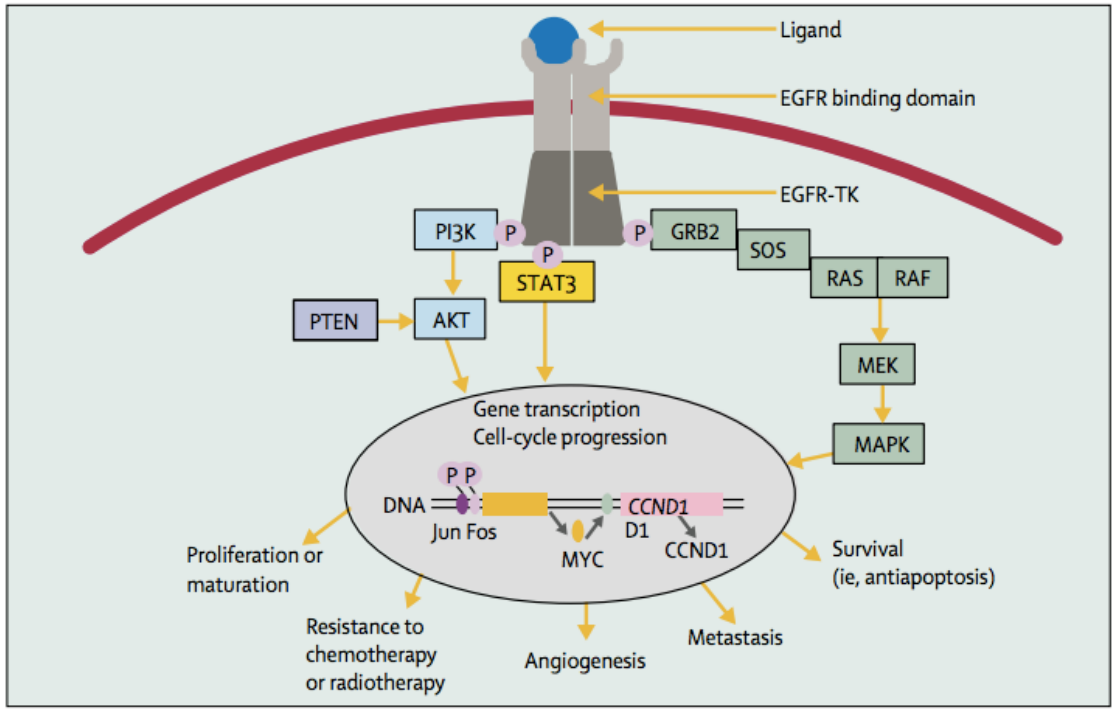


Figure 1: **EGFR signal transduction and its biological consequences**
TK=tyrosine kinase. P=phosphorylation. GRB2=growth factor receptor-bound protein 2. SOS=son of sevenless. MEK=MAPK kinase. PTEN=phosphatidyinositol-3,4,5-triphosphate 3-phosphatase.

Blackhall F, et al. *Lancet Oncol* 2006; 7: 499-507.
Sharma SV, et al. *Nature* 2007; 7: 169-181.

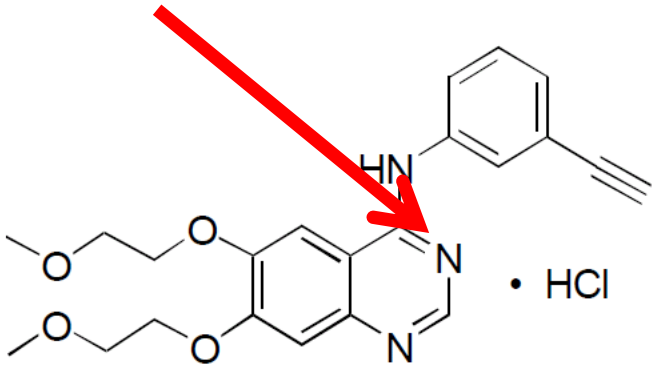
Gefitinib and Erlotinib PK

- Peak plasma levels ~ 3–7 h after dosing
- ~ 60% bioavailability
- Gefitinib unaffected by food
- Food increases erlotinib bioavailability
- **pH dependent solubility-decreased solubility at high pH**

Peters S. et al. Cancer Treatment Reviews 40 (2014) 917-926

Erlotinib Package Insert

- pK_a of 5.42
- Solubility dependent on protonation of secondary amine group
- Maximum solubility at pH of 2
- Drug interaction studies:
  - AUC decrease: omeprazole 46% and ranitidine 33%
  - C_{max} decrease: omeprazole 61% AND ranitidine 54%



Tarceva [package insert]. San Francisco, CA. Genentech 2012.

EGFR Package Insert

Impact of acid-reducing agents on the absorption of the oral EGFR tyrosine kinase inhibitors in healthy subjects.

Drug (dose)	Acid-reducing agent and regimen	Mean change		Dosing implications	References
		AUC	C_{max}		
Gefitinib (250 mg)	Ranitidine (450 mg, 13 h and 1 h before gefitinib)	↓ 44%	↓ 70%	Co-administration with H_2 receptor antagonists may reduce efficacy. Antacids if taken regularly close to administration of gefitinib may have a similar effect	[52]
Erlotinib (150 mg)	Omeprazole (40 mg) daily for 7 days	↓ 46%	↓ 61%	Avoid co-administration with proton pump inhibitors	[12]
	Ranitidine (300 mg daily for 5 days); erlotinib was given as a single dose after the ranitidine dose on the third day	↓ 33%	↓ 54%	Co-administration with H_2 receptor antagonists may reduce efficacy. If required, erlotinib must be taken at least 2 h before or 10 h after ranitidine dosing	
	Ranitidine (150 mg twice daily for 5 days); erlotinib 150 mg was given 2 h before and 10 h after ranitidine on the third day	↓ 15%	↓ 17%	The effect of antacids on erlotinib absorption has not been investigated. If use of antacids is considered necessary, administer at least 4 h before or 2 h after erlotinib	

Peters S. et al. Cancer Treatment Reviews 40 (2014) 917-926

An evaluation of the possible interaction of gastric acid suppressing medication and the EGFR tyrosine kinase inhibitor erlotinib☆

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[b] Department of Oncology, Princess Margaret Hospital, University of Toronto, 610 University Avenue, Toronto, Ontario, Canada M5G-2M9

- Retrospective analysis of BR.21
- Compare PK, efficacy, and safety in erlotinib arm in patients concurrently taking PPIs or H2RAs (AS arm) vs. patients not taking PPIs or H2RAs (non-AS arm)
- PK: median plasma erlotinib levels did not differ between AS vs. non-AS
- Efficacy: no apparent difference in OS (0.81) or PFS (0.16)
- Safety: AS vs. non-AS
  - Rash: 50.5% vs. 42% ($p = 0.08$)
  - Diarrhea: 27.9% vs. 15.6% ($p = 0.001$)
  - Infection: 33.7% vs. 20.0% ($p < 0.001$)

Hilton et al. *Lung Cancer* 82 (2013) 136-142.

The influence of gastric secretion inhibitors on gefitinib therapy in patients with non-small cell lung cancer harboring epidermal growth factor receptor activating mutations.

Subcategory:
Metastatic Non-small Cell Lung Cancer

Category:
Lung Cancer - Non-Small Cell Metastatic

Meeting:
2012 ASCO Annual Meeting

- Single-center study
- Compared AS vs. non-AS in patients receiving concomitant gefitinib
- 43 patients analyzed; 65.1% with concomitant AS

	AS	Non-AS	Statistics
RR	77.8%	73.3%	$p = 1.00$
PFS	291 days	353 days	HR, 1.23 Log-rank test, $p = 0.578$

Saeki S et al. J Clin Oncol 30, 2012 (suppl; abstr e18059)

EGFR and Acid Suppressants

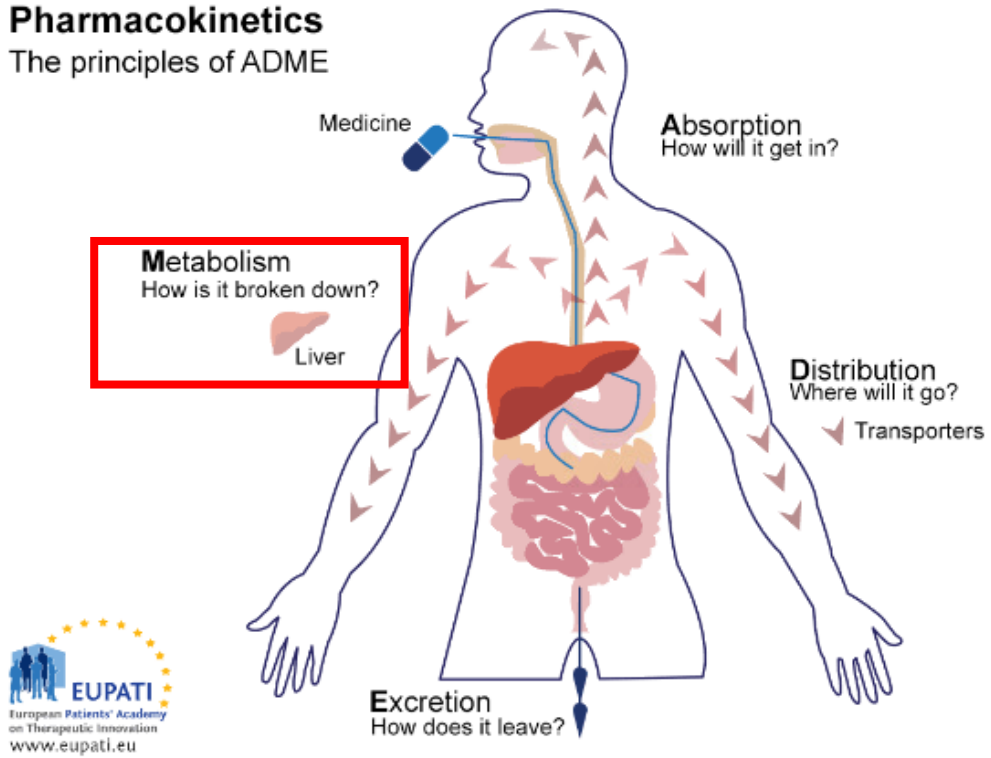
- AS has minimal impact on erlotinib and gefitinib absorption in the real-world setting
- AE data supports PK data
- AS has no clinical impact of EGFR efficacy

Absorption of Oral Anticancer Agents

- Drug-food interactions commonly have effects on oral anticancer treatments
- Alectinib should be taken with food
  - Bioavailability of alectinib was 37% under fed conditions
  - A high-fat, high-calorie meal increased the combined exposure of alectinib plus M4 (active metabolite) by 3.1 fold
- Erlotinib should be taken on an empty stomach (1 hour before or 2 hours after a meal)
  - Bioavailability is about 60% on an empty stomach
  - Food increase bioavailability to approximately 100%
- Check package insert for administration instructions on all oral anticancer treatments

Tarceva [package insert]. San Francisco, CA. Genentech 2012.
Alecensa [package insert]. New York City, NY. Pfizer 2018.

Pharmacokinetics Basics (cont.)



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Retrieved from https://www.eupati.eu/glossary/pharmacokinetics/

EGFR Inhibitor Metabolism

- Erlotinib
  - Metabolized by CYP3A4 (major) and CYP1A2 (minor)
  - Concomitant CYP3A4 inhibitors (strong)→ increase erlotinib exposure
    - Avoid use if possible
    - Dose reduction should be done in decrements of 50 mg if severe adverse reactions occur (after toxicity has resolved to baseline or ≤ grade 1)
  - Concomitant CYP3A4 and CYP1A2 inhibitor (e.g., ciprofloxacin) → increase erlotinib exposure
    - Avoid use if possible
    - Dose reduction should be done in decrements of 50 mg if severe adverse reactions occur (after toxicity has resolved to baseline or ≤ grade 1)
  - CYP3A4 inducers → decrease erlotinib exposure
    - Avoid use if possible
    - Increase erlotinib dose in 50 mg increments at 2 week intervals to a maximum of 450 mg
    - Reduce dose to recommended starting dose when CYP3A4 inducer is discontinued
  - CYP1A2 inducers (smoking) → decrease erlotinib exposure
    - Avoid use if possible
    - If unavoidable increase dose at 2 week intervals in 50 mg increments to a maximum dose of 300 mg

Tarceva [package insert]. San Francisco, CA. Genentech 2012.

EGFR Inhibitor Metabolism (cont.)

- Gefitinib
  - Metabolized by CYP3A4 (major) and CYP2D6 (minor)
  - CYP3A4 inducers (strong) → decrease gefitinib exposure
    - Avoid use if possible
    - Increase gefitinib to 500 mg once daily (in the absence of severe adverse drug reactions)
    - Reduce dose back to 250 mg once daily 7 days after discontinuing strong CYP3A4 inducer
  - CYP3A4 inhibitors (strong) → increase gefitinib exposure
    - Avoid use if possible

Clin Pharacokinet. 2005; 44 (10): 1067-1081

EGFR Inhibitor Metabolism (cont.)

- Osimertinib
  - Metabolized by CYP3A4 (major)
  - Concomitant CYP3A4 inhibitors (strong)
    - Avoid use if possible
    - If no alternative exists, monitor patients more closely for adverse reactions
  - Concomitant CYP3A4 inducers (strong)
    - Avoid use if possible
  - Effect of osimertinib on other drugs
    - Avoid concomitant use of sensitive substrates of CYP3A4, BRCP or CYP1A2 with narrow therapeutic index
    - e.g. fentanyl, cyclosporine, quinidine, ergot alkaloids, phenytoin, carbamazepine

Tagrisso [package insert]. Wilmington, DE. Astra Zeneca 2015.

ALK Inhibitor Metabolism

- Alectinib
  - Metabolized by CYP3A4 to active metabolite M4
  - Excreted in feces (96%)
  - Strong CYP3A4 inhibitor (posaconazole), strong CYP3A4 inducer (rifampin) or acid-reducing had no clinically meaningful effect on combined exposure of alectinib plus M4
- Lorlatinib
  - CYP3A4 (major) and UGT1A4
  - Minor contributions from CYP2C8, CYP2C19, CYP3A5 and UGT1A3
  - CYP3A4 inducers (strong)
    - Avoid use. Contraindicated.
  - CYP3A4 inhibitors (strong)
    - Avoid use if possible
    - Decrease dose in 25 mg decrements and monitor for untoward AEs

Alecensa [package insert]. San Francisco, CA. Genentech 2017.
Lorbrena [package insert]. New York City, NY. Pfizer 2018.

Pemetrexed

- Folate antagonist
  - Results in inhibition of DNA synthesis
  - Multi-targeted antifolate
- Undergoes extensive renal excretion
- Avoid in patients with renal impairment (CrCl < 30 mL/min)
  - Dose reduction with CrCl < 45 mL/min
- Drug interaction: NSAIDs/ASA
  - Should not be given within 2 days prior to or after treatment

Devita, Hellman, Rosenberg. Cancer: Principles & Practice of Oncology. 9th Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2011

Taxanes

- “Broad spectrum” chemotherapy option
- Promote microtubule depolymerization
- Paclitaxel and docetaxel
- Undergo CYP3A4 and CYP2C8 metabolism
  - Dose adjustments required for hepatic impairment
  - Avoid concomitant use with CYP3A4 inhibitors/inducers (not well studied)

Devita, Hellman, Rosenberg. Cancer: Principles & Practice of Oncology. 9th Ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2011

Paclitaxel Drug Interaction Case

- WD is a 62-year-old male with newly diagnosed stage IV squamous cell carcinoma of the lung. Of note, during a recent hospital visit, he was found to have paroxysmal atrial flutter. He was started on diltiazem for this while admitted to the hospital. He presented to clinic for consideration of starting Cycle 1 Day 1 of carboplatin/nab-paclitaxel/pembrolizumab.
- Other meds: diltiazem 120 mg, sertraline 50 mg, oxycodone 10 mg, docusate 50 mg
- What drug-drug interactions should you be concerned about?

Paclitaxel Drug Interaction Case (cont.)

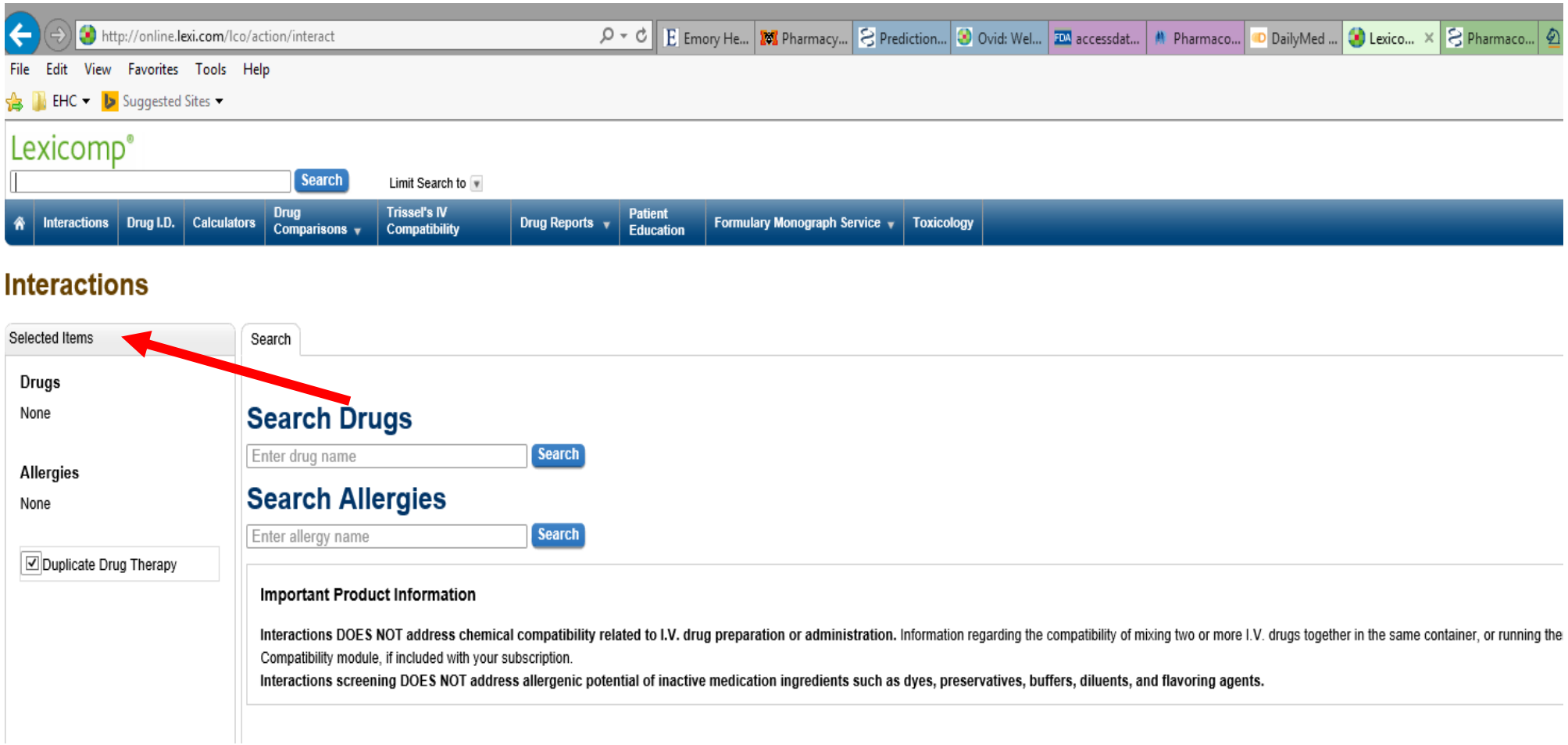
- Diltiazem: moderate CYP3A4 inhibitor
- 1/10/19: Carboplatin/nab-paclitaxel/pembrolizumab given with 50% nab-paclitaxel dose reduction
- Grade 4 thrombocytopenia

Platelet Count	
L 148 10E3/mcL	3/7/2019 12:58
163 10E3/mcL	2/28/2019 02:50
170 10E3/mcL	2/27/2019 02:18
168 10E3/mcL	2/26/2019 00:42
169 10E3/mcL	2/25/2019 00:41
164 10E3/mcL	2/24/2019 00:57
196 10E3/mcL	2/23/2019 01:02
169 10E3/mcL	2/22/2019 02:57
167 10E3/mcL	2/21/2019 03:59
159 10E3/mcL	2/20/2019 07:19
161 10E3/mcL	2/19/2019 03:25
152 10E3/mcL	2/18/2019 01:48
154 10E3/mcL	2/17/2019 04:30
150 10E3/mcL	2/16/2019 02:42
L 149 10E3/mcL	2/15/2019 04:07
205 10E3/mcL	2/14/2019 18:23
214 10E3/mcL	2/14/2019 12:56
L 115 10E3/mcL	2/7/2019 13:29
* C 18 10E3/mcL	1/24/2019 12:54
L 79 10E3/mcL	1/17/2019 14:37
153 10E3/mcL	1/10/2019 08:58

Avoiding Common Drug-Drug Interactions: Alternative Therapies

- Antifungal strong CYP3A4 inhibitors: itraconazole, ketoconazole, posaconazole, fluconazole (moderate), voriconazole
  - Alternative therapy: nystatin
- Anti-seizure strong CYP3A4 inducers: phenytoin, phenobarbital, carbamazepine
  - Alternative therapy: levetiracetam
- Antiretrovirals strong CYP3A4 inhibitors: atazanavir, cobicistat, indinavir, ritonavir, saquinavir, nelfinavir
  - Alternative therapy: consult infectious disease specialist
- Grapefruit/grapefruit juice strong CYP3A4 Inhibitor: AVOID USE

Checking for Drug Interactions



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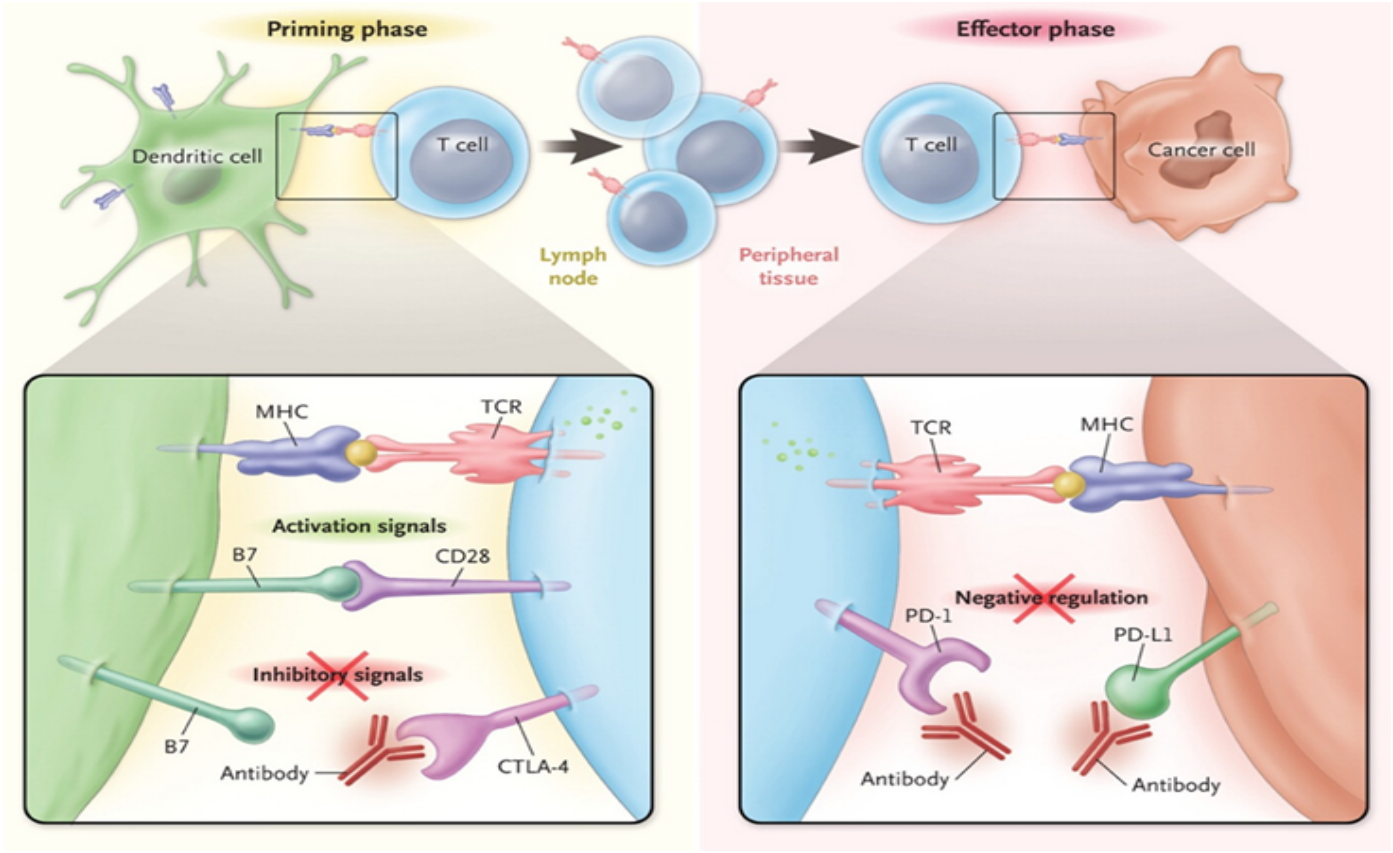
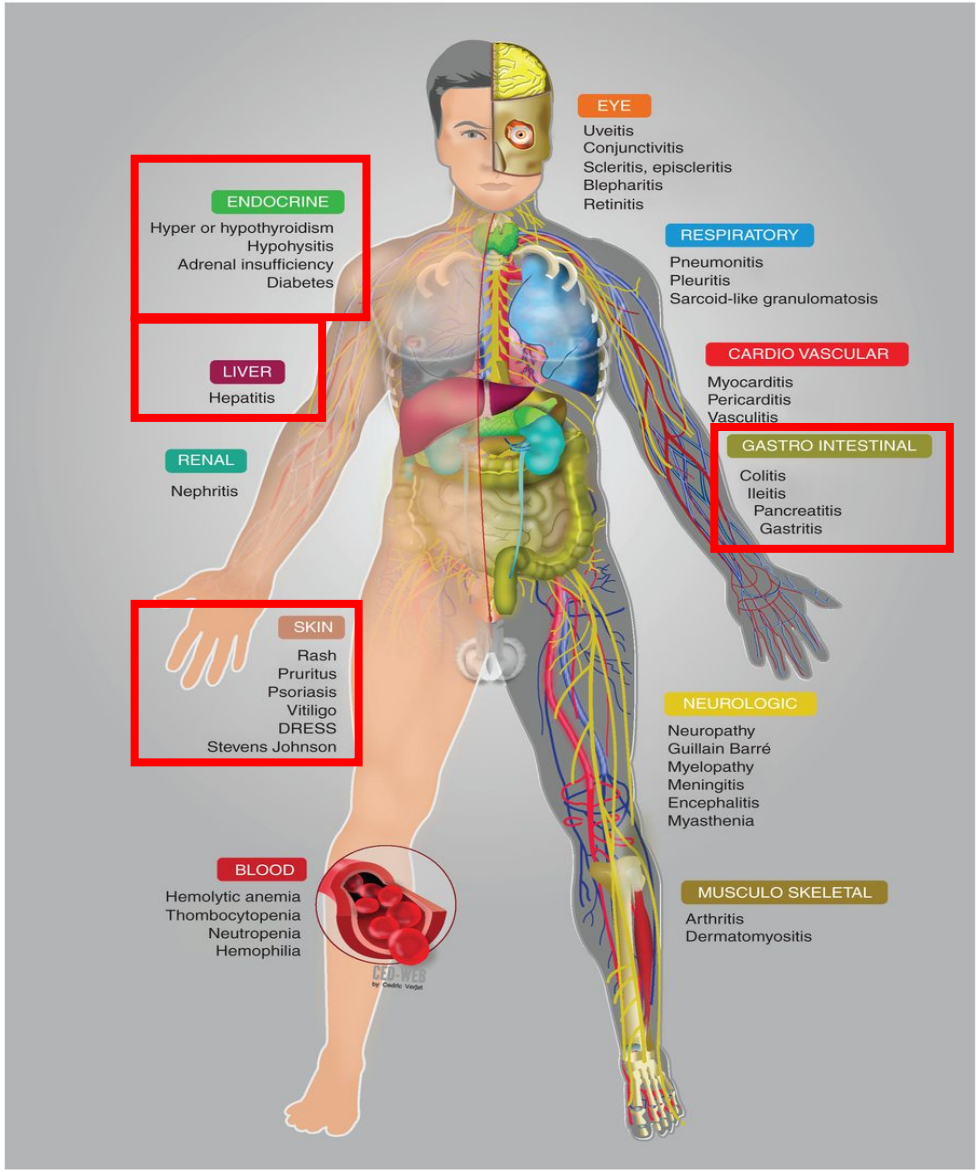
Immunotherapy: PD-1/PD-L1 Inhibitors



Ribas A. Tumor Immunotherapy directed at PD-1. *N Engl J Med*. 2012; 366(26): 2517-2519

Recognizing irAEs



Champiat S, Lambotte O, et al. Management of immune checkpoint blockade dysimmune toxicities: a collaborative position paper. Ann Oncol 2016; 27(4): 559-574

Immunotherapy in Autoimmune Disease

- Potential for irAEs is more of a concern in this patient population
- Clinical trials have excluded patients with pre-existing autoimmune disease
- Immunotherapy studies in patients with pre-existing autoimmune disease limited to retrospective case series
- Type of immunotherapy, type of autoimmune disease, and type of autoimmune treatment play a role in patient selection

Kennedy, L. C. *JNCCN*. 2019;17(6): 750-757

irAEs in Patients Without Pre-Existing Autoimmune Disease

Table 1. irAEs in Phase III Trials Using ICIs in Locally Advanced or Metastatic Solid Tumors

Study	N[a]	Tumor	Agent	ORR	All Grades irAE Rate	Grade ≥3 irAE Rate	Rate of Permanent Discontinuation Due to Toxicity[b]
Borghaei et al[30]	292	NSCLC	Nivolumab	19%	69%	10%	5%
Wolchok et al[31]	316	Melanoma	Nivolumab	44%	86%	21%	12%
Robert et al[32]	279	Melanoma	Pembrolizumab	33%	80%	13%	4%
Reck et al[33]	154	NSCLC	Pembrolizumab	45%	73%	27%	7%
Rittmeyer et al[34]	425	NSCLC	Atezolizumab	14%	64%	15%	8%
Motzer et al[35]	406	RCC	Nivolumab	25%	79%	19%	8%
Powles et al[36]	467	Urothelial	Atezolizumab	13%	69%	6%	3%
Bellmunt et al[37]	270	Urothelial	Pembrolizumab	21%	61%	15%	6%
Wolchok et al[31]	315	Melanoma	Ipilimumab	19%	86%	28%	16%
Wolchok et al[31]	314	Melanoma	Ipilimumab + nivolumab	58%	96%	59%	39%
Motzer et al[38]	550	Intermediate + poor-risk RCC	Ipilimumab + nivolumab	42%	93%	46%	22%

Abbreviations: ICI, immune checkpoint inhibitor; irAE, immunotherapy-related adverse event; NSCLC, non–small cell lung cancer; ORR, objective response rate; RCC, renal cell carcinoma.
[a]Number of patients in the trial, none of which had autoimmune disease.
[b]Percentage of the intention-to-treat population.

Kennedy, L. C. *JNCCN*. 2019;17(6): 750-757

irAEs in Patients With Pre-Existing Autoimmune Disease

Table 2. Retrospective Case Series Evaluating ICI Use in Patients With AID

Study	N[a]	Tumor	ICI	AID	Treatment for AID[b]	ORR	AID Flare Rate[c]	irAE Rate[d]	Rate of Permanent Discontinuation Due to Toxicity[e]
Tison et al[40]	112	Melanoma (59%) NSCLC (35%) Other (6%)	PD-1/PD-L1 in 85% of patients	Ps/PsA, RA, IBD, SA, SLE, PMR/TA	22%	Melanoma: 48% NSCLC: 54%	42% Gr 3/4: 13%	38% Gr 3–5: 16%	Not stated
Leonardi et al[41]	56	NSCLC	PD-1/PD-L1	RA, PMR/TA, Scleroderma, Ps/PsA, Thyroiditis, IBD, MG, MS	20%	22%	23% Gr 3/4: 4%	38% Gr 3/4: 10%	14%
Menzies et al[42]	52	Melanoma	PD-1	RA, PMR, SS, ITP, Ps, IBD, GBS, MG, Thyroiditis, SLE	38%	33%	38% Gr 3/4: 6%	29% Gr 3/4: 10%	12%
Danlos et al[43]	45	Melanoma (80%) NSCLC (13%) Other (7%)	PD-1	Vitiligo, Ps/PsA, Thyroiditis, RA, ITP, SA, MS, MG, PMR, PAN, Sarcoidosis, T1 DM	16%	38%	24%	22%	9%
Johnson et al[44]	29	Melanoma	Ipilimumab	RA, Ps, Thyroiditis, MS, IBD, SLE, Sarcoidosis	41%	21%	24%	31% Gr 3–5: 31%	Not stated
Gutzmer et al[45]	19	Melanoma	PD-1	Ps/PsA, RA, Vasculitis, PMR, SA, Sarcoidosis, IBD, GBS, MS, MG, Thyroiditis	32%	32%	42%	16%	0%
Richter et al[46]	16	Melanoma NSCLC NHL	PD-1 (69%) Ipilimumab (31%)	RA, PMR, Sarcoidosis, SLE, Vasculitis	44%	Not stated	6%	38% Gr 3/4: 25%	31%
Lee et al[47]	8	Melanoma	Ipilimumab	RA	87.5%	50%	75% Gr 3/4: 25%	50% Gr 3/4: 50%	62.5%

Abbreviations: AID, autoimmune disease; GBS, Guillain-Barré syndrome; Gr, grade; IBD, inflammatory bowel disease; ICI, immune checkpoint inhibitor; irAE, immunotherapy-related adverse event; ITP, idiopathic thrombocytopenic purpura; MG, myasthenia gravis; MS, multiple sclerosis; NHL, non-Hodgkin lymphoma; NSCLC, non–small cell lung cancer; ORR, objective response rate; PAN, polyarteritis nodosa; PMR, polymyalgia rheumatica; Ps, psoriasis; PsA, psoriatic arthritis; RA, rheumatoid arthritis; SA, spondylosing arthropathy; SLE, systemic lupus erythematosus; SS, Sjogren's syndrome; T1 DM, type 1 diabetes mellitus; TA, temporal arteritis.

[a]Includes only patients in the study with preexisting autoimmune disease.

[b]Percentage of patients on baseline chronic immunosuppression for treatment of an AID at time of ICI initiation.

[c]Percentage of the intention-to-treat population.

[d]Excludes immunotherapy-related events that were felt to be an exacerbation of the patient's underlying autoimmune disorder.

[e]Percentage of the intention-to-treat population that permanently discontinued therapy for either AID exacerbation or irAEs.

Kennedy, L. C. *JNCCN*. 2019;17(6): 750-757

Immunotherapy in Autoimmune Disease: Drug-Drug Interactions

- Concern that baseline immunosuppression at time of immunotherapy initiation may decrease efficacy
- Retrospective case series in NSCLC showed corticosteroid doses ≥ 10 mg/day prednisone associated with lower response rates, progression-free survival, and overall survival
- Several case series have shown increased rates of irAEs and decreased efficacy in patients with autoimmune disease on immunosuppression and immunotherapy treatment
- However, other studies have shown no correlation between steroid initiation for toxicity and immunotherapy efficacy → data somewhat mixed

JNCCN 2019;17: 750-757
J Clin Oncol 2018; 36: 2872-2878

Immunotherapy in Autoimmune Disease: Recommendations

- Immunotherapy may be considered
  - Consult with appropriate autoimmune subspecialist
  - Low level of or no immunosuppression with good control of underlying autoimmune disorder
  - Patient informed consent
- Avoid immunotherapy
  - Autoimmune neurologic or neuromuscular disease (e.g., myasthenia gravis)
  - Life-threatening autoimmune disease
  - Patients with poor control of autoimmune disease OR requiring high doses of immunosuppressants for control

JNCCN 2019;17: 750-757

Drug-Herb Interactions

- Study of 1,901,815 cancer patients showed that complementary and alternative medicine was associated with refusal of conventional treatment and 2-fold increase in risk of death
- Common herbs/supplements used to treat cancer have potential drug interactions
  - Milk Thistle: potentially inhibits CYP3A4, CYP2D6, CYP1A2, and CYP2C9
  - Turmeric: potentially inhibits CYP3A4 and CYP1A2
  - Mushroom supplements: potential for hepatotoxicity → increased drug exposure
- About Herbs: https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine/herbs
- Natural Medicines Database: available via institutional access

JAMA Oncol. 2018; 4(10): 1375-1381

QT Prolonging Agents

- Many drugs can prolong the QT interval including: ondansetron, palonosetron, granisetron, dolasetron, haloperidol, metoclopramide, olanzapine, prochlorperazine
- Additional risk factors: congenital long QT syndrome, CHF, bradycardia and electrolyte abnormalities (hypokalemia, hypomagnesemia)
  - Baseline EKG may be warranted for these patients
- Other drugs that can prolong QT interval: antibiotics, tricyclic antidepressants, antihistamines, antipsychotics, SSRIs
- Palonosetron may be better at preventing delayed nausea due to long half life (40 hours)
  - Caution with multiple days of 5-HT3 inhibitors in this setting

QT Prolonging Agents (cont.)

- A baseline QTc interval > 440 ms for men and > 450 ms for women is considered abnormal
- Prolongation of the QTc interval to > 500 ms or an increase of > 60 ms is considered to increase the risk of Torsades de pointes and ECG monitoring is recommended
- Granisetron and palonosetron appear to have the lowest risk of QTc prolongation
  - Dose can also play a part (lower doses have less risk)
  - Route can also contribute (PO less than IV)

Audience Response Question

The following statement is true about taking proton pump inhibitors (PPI) or H_2 blockers with EGFR tyrosine kinase inhibitors (TKIs):

A. It should be avoided at all costs due to potential to interfere with absorption

B. They should be spaced out by 12 hours to improve the absorption of the EGFR TKI

C. Patients who took PPIs or H_2 blockers with EGFR TKIs had decreased efficacy of the EGFR inhibitor on their cancer

D. There was little to no effect on the pharmacokinetics when giving a PPI or H_2 blocker with an EGFR TKI

E. Unsure

Audience Response Question

A 62-year-old female patient with NSCLC and h/o cardiac ischemia is to be treated with a 5HT-3 receptor antagonist. Which drug would you consider that would have the least risk of prolonging the QT interval?

A. Ondansetron
B. Palonosetron
C. Dolasetron
D. Unsure

Questions?