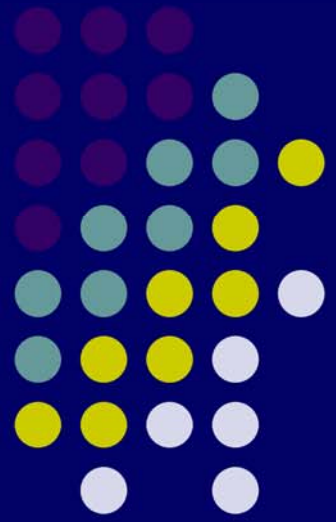
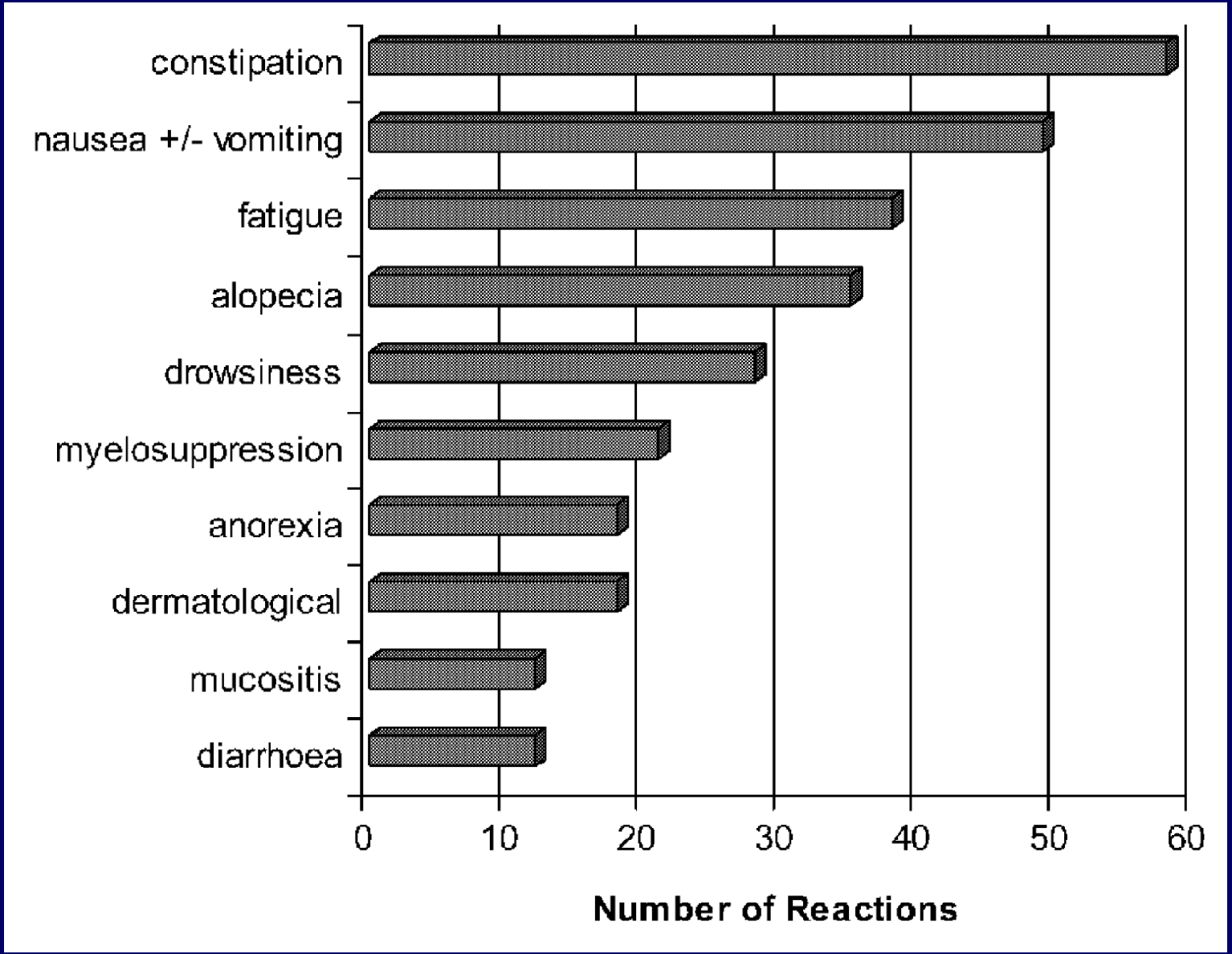
# Quadruplet regimen for CINV in HEC

Manit Sae-teaw
B.Pharm, BCOP, BCP
Grad dip in Pharmacotherapy
Faculty of pharmaceutical sciences
Ubon Ratchathani University

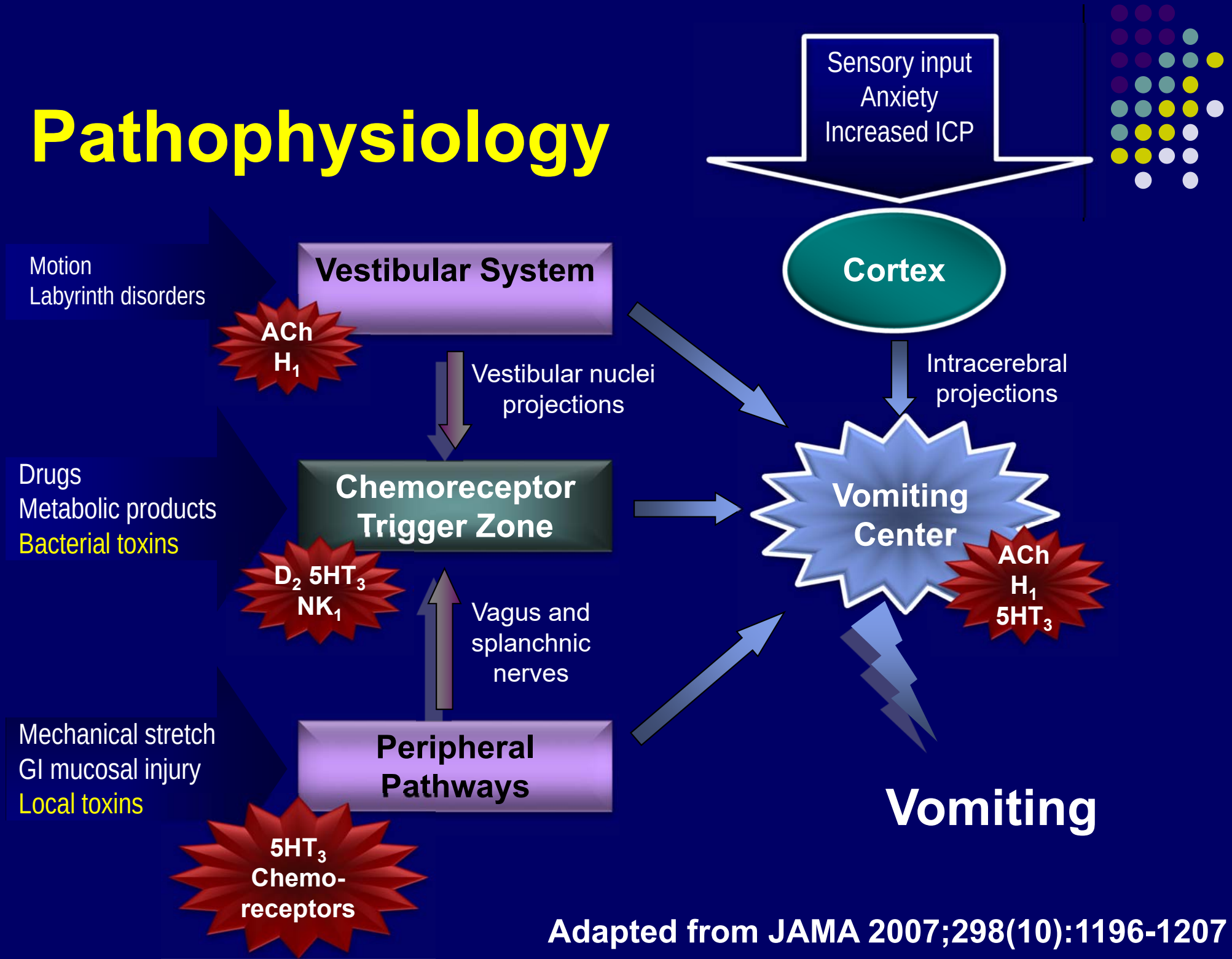


# The ten most common adverse drug reactions (ADRs) in oncology patients: do they matter to you?



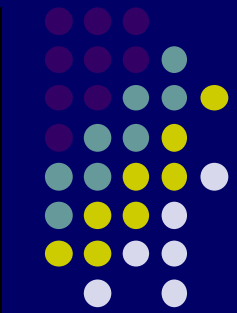

Ref. Lau PM, etal. Support Care Cancer 2004;12:626.

# Pathophysiology




Adapted from JAMA 2007;298(10):1196-1207

# Classes of Antiemetic Agents



- Serotonin Antagonists
- $NK_1$ Receptor Antagonist (i.e. Aprepitant)
- Dopamine antagonists
  - Metoclopramide
  - Phenothiazines (i.e. Prochloroperazine)
  - Butyrophenones (i.e. Haloperidol)
  - Olanzapine
- Corticosteroids
- Benzodiazepines
- Cannabinoids (i.e. Marinol®)

# Definition
## Pharmaceutical care

- American Society of Health-System Pharmacists (1992)
  - The mission of the pharmacist is to provide pharmaceutical care
  - Pharmaceutical care is the direct, responsible provision of medication-related care for the propose of achieving definite outcome that improve a patient ‘s quality of life

Ref : ASHP statement on pharmaceutical care.
www.ashp.org

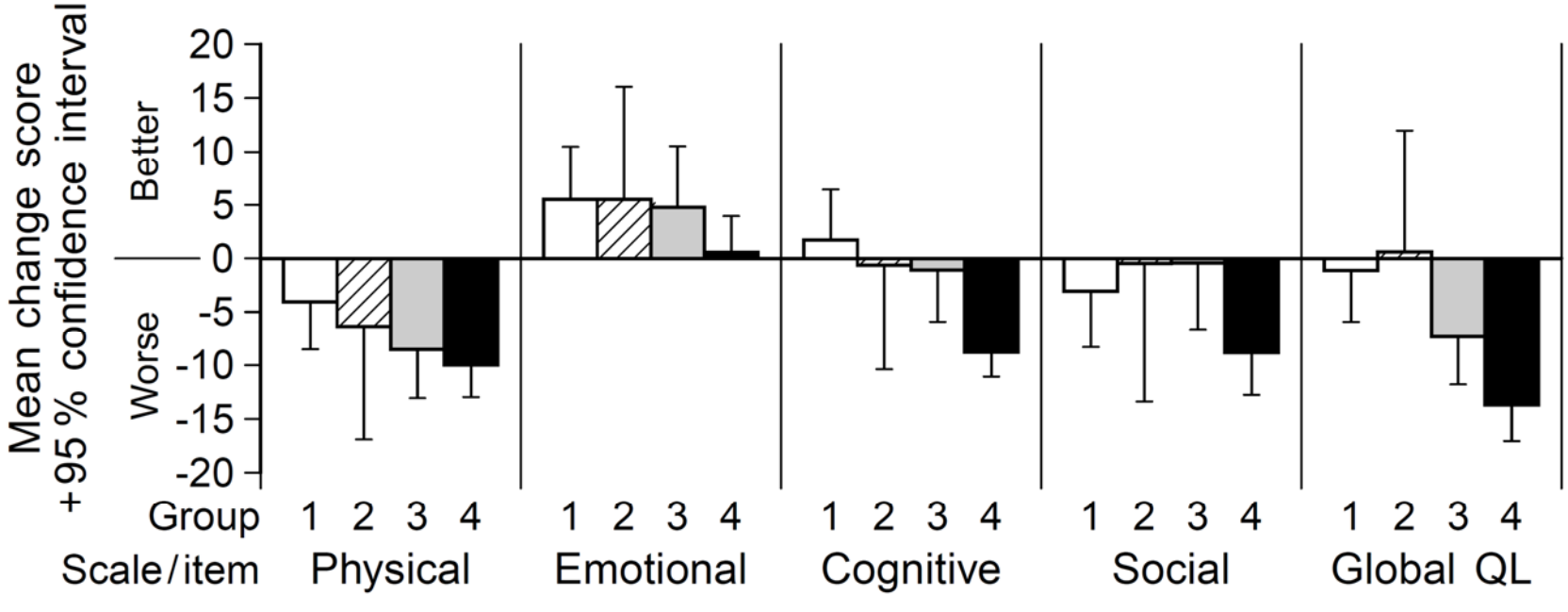
ORIGINAL ARTICLE

# N/V and QOL

## Prospective study design

**Effect of postchemotherapy nausea and vomiting on health-related quality of life**

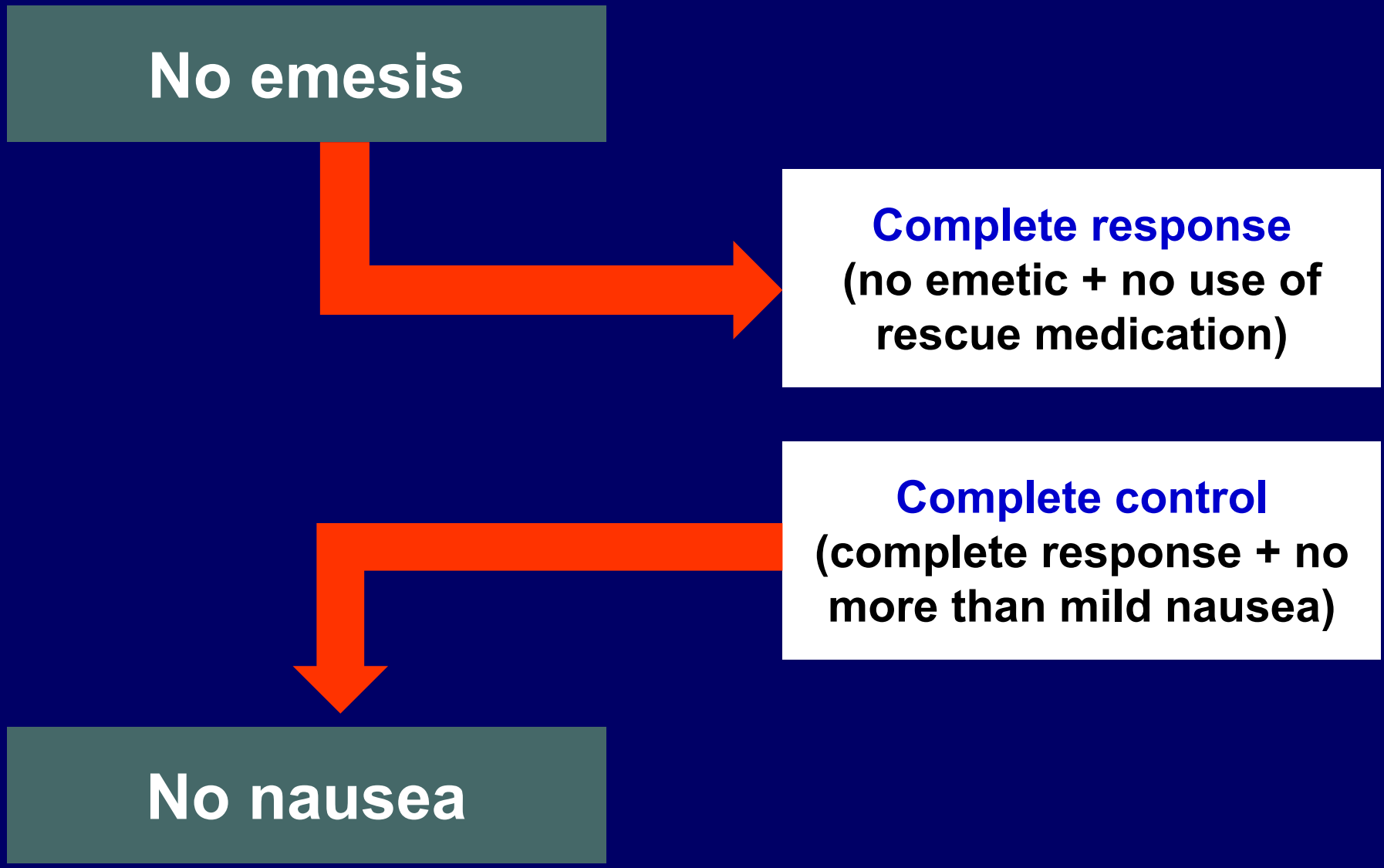
- 832 chemotherapy patients (HEC and MEC)
- EORTC (QLQ-C30)



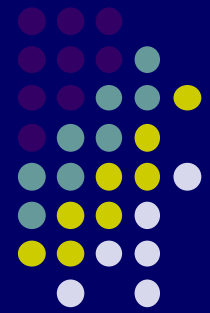

| | | | | | |
|---|---|---|---|---|---|
| Group 1: No nausea, no vomiting | -3.8 ± 5.0 | 5.3 ± 4.8 | 1.9 ± 4.0 | -2.6 ± 6.1 | -1.1 ± 4.5 |
| Group 2: Vomiting, no nausea | -5.7 ± 11.7 | 5.3 ± 11.1 | -0.6 ± 9.8 | -0.6 ± 14.0 | 0.6 ± 11.1 |
| Group 3: Nausea, no vomiting | -8.7 ± 5.0 | 4.9 ± 5.0 | -1.1 ± 4.2 | -0.5 ± 6.1 | -7.4 ± 4.8 |
| Group 4: Nausea and vomiting | -10.0 ± 3.4 | 0.8 ± 3.4 | -8.4 ± 2.9 | -8.8 ± 4.2 | -14.2 ± 3.2 |

Ref : Osaba D, et al. Support Care Cancer 1997;5:307.

# Evolution of CINV outcome



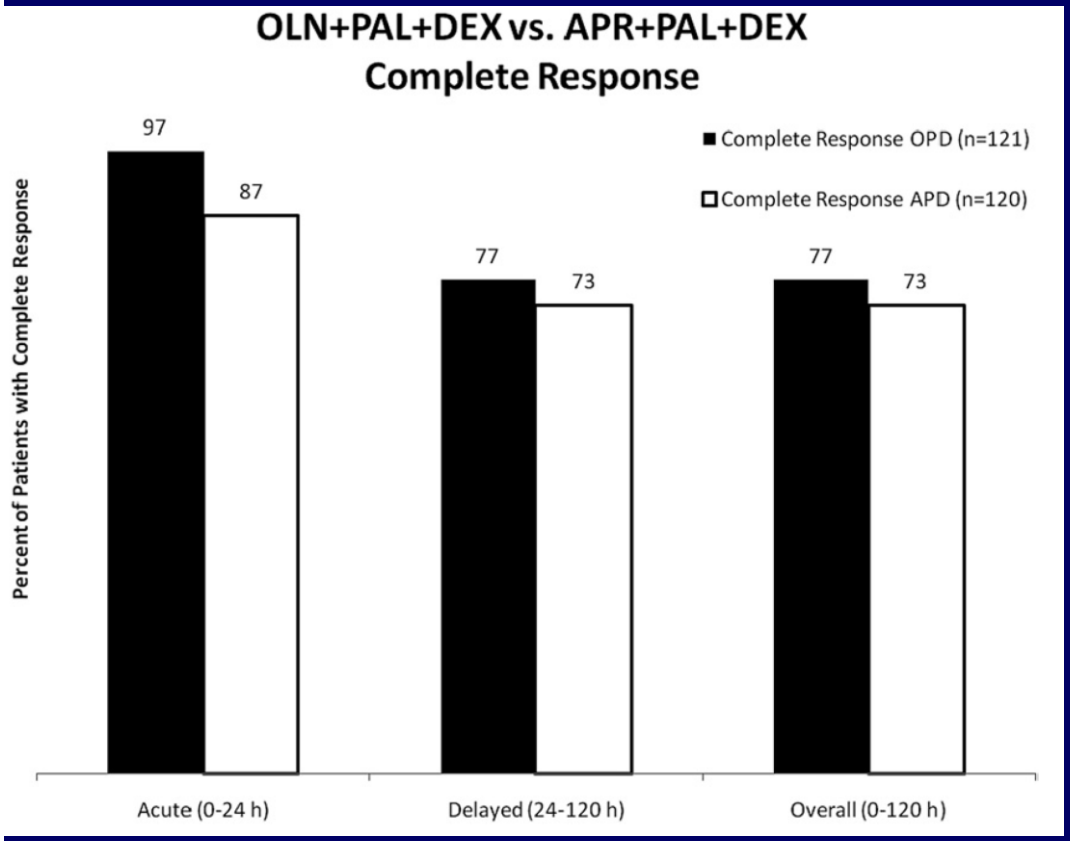
# Olanzapine versus aprepitant for prevention CINV

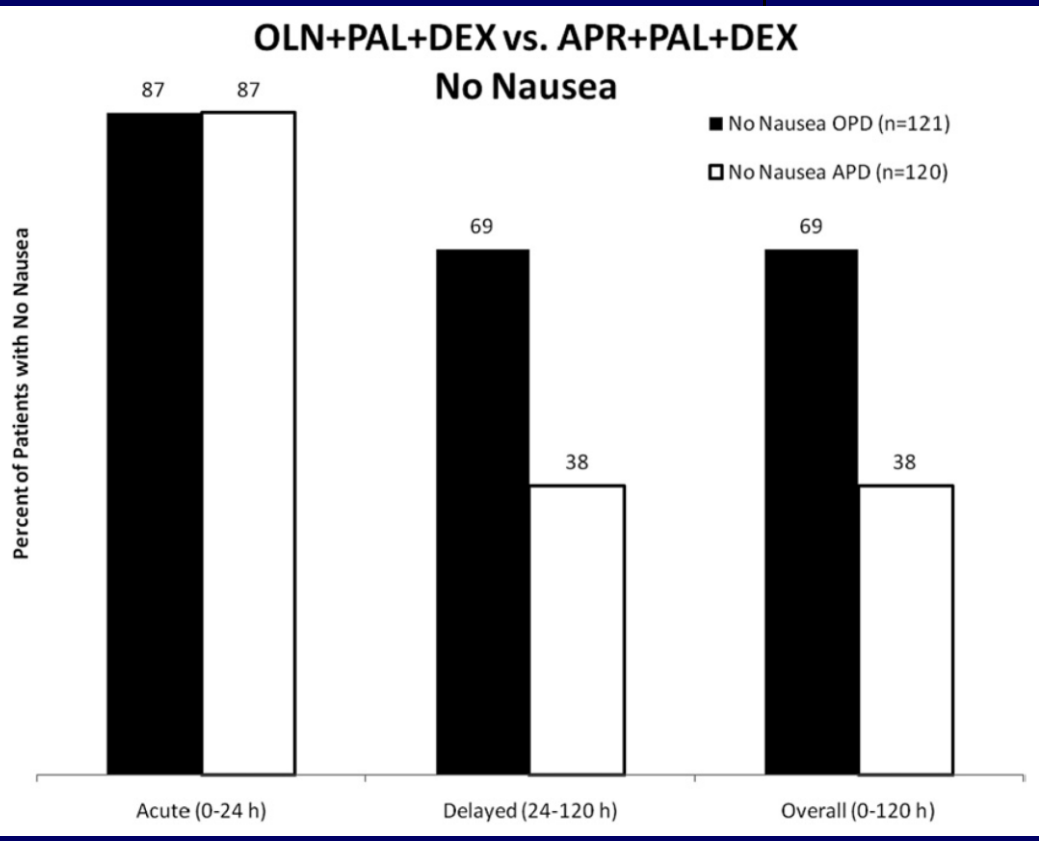


- Phase III, Randomised, open label
- 241 patients with HEC (including AC)
- Compare
  - Olanzapine 10 mg/d (D1-4) + Palonosetron 0.25 mg IV (D1) + Dexa 20 mg IV (D1)
  - Aprepitant 125 mg (D1) then 80 mg (D2-3) Palonosetron 0.25 mg IV (D1) + Dexa 12 mg IV (D1) then 4 mg bid (D2-4)
- Outcome
  - Complete response (no emetic, no rescue medication)

Ref : Navari RM, et al. J Support Oncol 2011;9:188.

# Olanzapine versus aprepitant for prevention CINV




**NS for all CR**

**P<0.05 for delayed and overall nausea**

Ref : Navari RM, et al. J Support Oncol 2011;9:188.

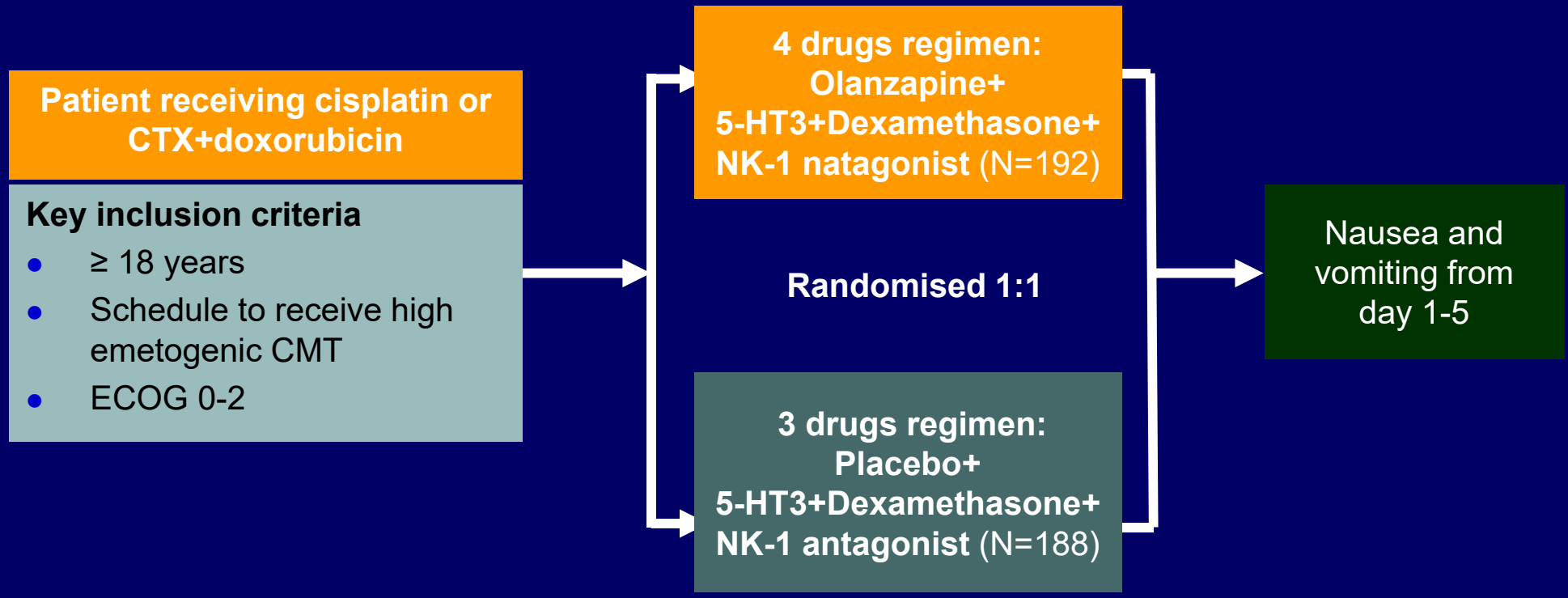
# Olanzapine prevent CINV

## Phase 3, double-blind study design

ORIGINAL ARTICLE

Olanzapine for the Prevention of Chemotherapy-Induced Nausea and Vomiting

Rudolph M. Navari, M.D., Rui Qin, Ph.D., Kathryn J. Ruddy, M.D., Heshan Liu, Ph.D., Steven F. Powell, M.D., Madhuri Bajaj, M.D., Leah Dietrich, M.D., David Biggs, M.D., Jacqueline M. Lafky, M.S., and Charles L. Loprinzi, M.D.




- **Primary endpoint: No nausea**
- **Secondary endpoint: complete response**

**Ref : Navari RM, et al. N Engl J Med 2016;375:134.**

# Olanzapine for CINV prevention

**Table 2.** Primary End Point According to Study Group.

| Variable | Olanzapine (N = 192) | Placebo (N = 188) | Total (N = 380) | P Value* | Adjusted P Value† |
|---|---|---|---|---|---|
| | *number/total number (percent)* | | | | |
| 0–24 hr after chemotherapy | | | | | |
| No nausea | 135/183 (73.8) | 82/181 (45.3) | 217/364 (59.6) | <0.001 | 0.002 |
| Nausea | 48/183 (26.2) | 99/181 (54.7) | 147/364 (40.4) | | |
| 25–120 hr after chemotherapy | | | | | |
| No nausea | 75/177 (42.4) | 45/177 (25.4) | 120/354 (33.9) | 0.001 | 0.002 |
| Nausea | 102/177 (57.6) | 132/177 (74.6) | 234/354 (66.1) | | |
| 0–120 hr after chemotherapy | | | | | |
| No nausea | 66/177 (37.3) | 39/178 (21.9) | 105/355 (29.6) | 0.002 | 0.002 |
| Nausea | 111/177 (62.7) | 139/178 (78.1) | 250/355 (70.4) | | |

Ref : Navari RM, et al. N Engl J Med 2016;375:134.

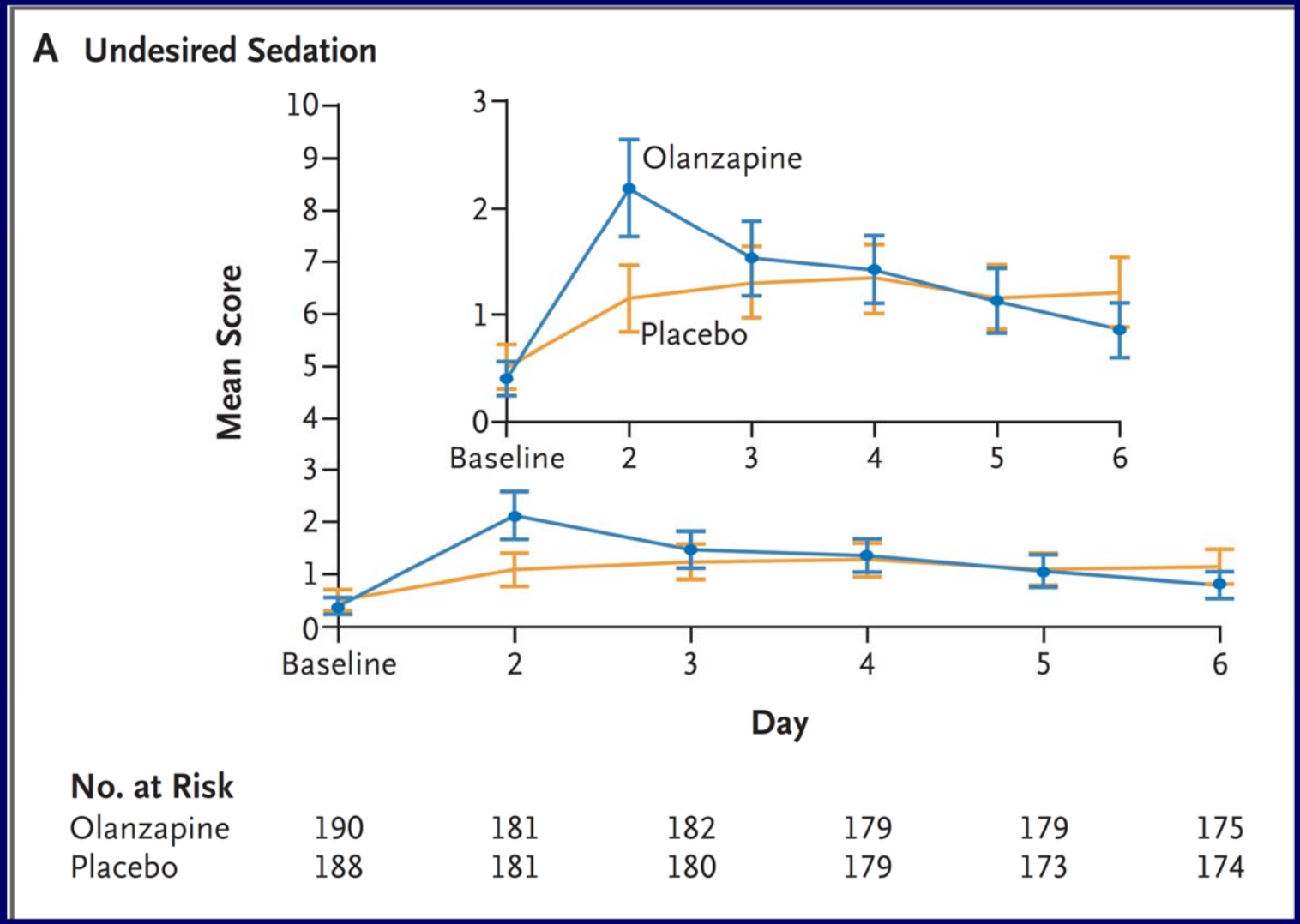
# Olanzapine for CINV prevention

Table 3. Complete Response According to Study Group.*

| Complete Response | Olanzapine (N=192) | Placebo (N=188) | Total (N=380) | Odds Ratio† | P Value‡ | Adjusted P Value§ |
|---|---|---|---|---|---|---|
| | | | *number/total number (percent)* | | | |
| 0–24 hr after chemotherapy | | | | 0.30 | | |
| No | 26/182 (14.3) | 64/181(35.4) | 90/363 (24.8) | | | |
| Yes | 156/182 (85.7) | 117/181 (64.6) | 273/363 (75.2) | | <0.001 | <0.001 |
| 25–120 hr after chemotherapy | | | | 0.55 | | |
| No | 54/163 (33.1) | 80/168 (47.6) | 134/331 (40.5) | | | |
| Yes | 109/163 (66.9) | 88/168 (52.4) | 197/331 (59.5) | | 0.007 | 0.007 |
| 0–120 hr after chemotherapy | | | | 0.39 | | |
| No | 59/162 (36.4) | 101/170 (59.4) | 160/332 (48.2) | | | |
| Yes | 103/162 (63.6) | 69/170 (40.6) | 172/332 (51.8) | | <0.001 | <0.001 |

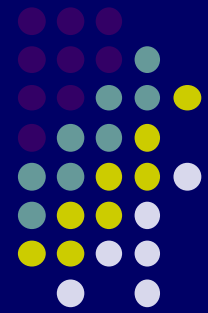
Ref : Navari RM, et al. N Engl J Med 2016;375:134.

# Olanzapine for CINV prevention




Ref : Navari RM, et al. N Engl J Med 2016;375:134.

# American Society of Clinical Oncology (ASCO)



- Key recommendation
  - (Updated) Adult pts who are treated with HEC should be offered **FOUR drug combination**
  - (Updated) Adult pts who are treated with Anthracyline+Cyclophosphamide should be offered **FOUR drug combination**

Ref : ASCO, 2017

ASCO® AMERICAN SOCIETY OF CLINICAL ONCOLOGY

# Regimen for HEC

| Emetic Risk Category | Dose on Day of Chemotherapy | Dose on Subsequent Days |
|---|---|---|
| High: Cisplatin and other agents | | |
| $NK_1$ receptor antagonist | | |
| Aprepitant | 125 mg oral | 80 mg oral on days 2 and 3 |
| Fosaprepitant | 150 mg IV | |
| Netupitant-palonosetron | 300 mg netupitant/0.5 mg palonosetron oral in single capsule (NEPA) | |
| Rolapitant | 180 mg oral | |
| 5-$HT_3$ receptor antagonist* | | |
| Granisetron | 2 mg oral or 1 mg or 0.01 mg/kg IV or 1 transdermal patch or 10 mg subcutaneous | |
| Ondansetron | 8 mg oral twice daily or 8 mg oral dissolving tablet twice daily or three 8 mg oral soluble films or 8 mg or 0.15 mg/kg IV | |
| Palonosetron | 0.50 mg oral or 0.25 mg IV | |
| Dolasetron | 100 mg oral only | |
| Tropisetron | 5 mg oral or 5 mg IV | |
| Ramosetron | 0.3 mg IV | |
| Dexamethasone | | |
| If aprepitant is used † | 12 mg oral or IV | 8 mg oral or IV once daily on days 2-4 |
| If fosaprepitant is used† | 12 mg oral or IV | 8 mg oral or IV on day 2; 8 mg oral or IV twice daily on days 3 and 4 |
| If netupitant-palonosetron is used† | 12 mg oral or IV | 8 mg oral or IV once daily on days 2-4 |
| If rolapitant is used | 20 mg oral or IV | 8 mg oral or IV twice daily on days 2-4 |
| Olanzapine | 10 mg oral | 10 mg oral on days 2-4 |

Ref : ASCO, 2017

ASCO® AMERICAN SOCIETY OF CLINICAL ONCOLOGY

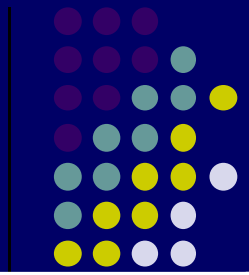
# Regimen for Anthracycline+Cyclophosphamide

| Emetic Risk Category | Dose on Day of Chemotherapy | Dose on Subsequent Days |
|---|---|---|
| High: Anthracycline combined with cyclophosphamide‡ | | |
| $NK_1$ receptor antagonist | | |
| Aprepitant | 125 mg oral | 80 mg oral; days 2 and 3 |
| Fosaprepitant | 150 mg IV | |
| Netupitant-palonosetron | 300 mg netupitant/0.5 mg palonosetron oral in single capsule (NEPA) | |
| Rolapitant | 180 mg oral | |
| 5-$HT_3$ receptor antagonist* | | |
| Granisetron | 2 mg oral or 1 mg or 0.01 mg/kg IV or 1 transdermal patch or 10 mg subcutaneous | |
| Ondansetron | 8 mg oral twice daily or 8 mg oral dissolving tablet twice daily or three 8 mg oral soluble films or 8 mg or 0.15 mg/kg IV | |
| Palonosetron | 0.50 mg oral or 0.25 mg IV | |
| Dolasetron | 100 mg oral only | |
| Tropisetron | 5 mg oral or 5 mg IV | |
| Ramosetron | 0.3 mg IV | |
| Dexamethasone | | |
| If aprepitant is used† | 12 mg oral or IV | |
| If fosaprepitant is used† | 12 mg oral or IV | |
| If netupitant-palonosetron is used† | 12 mg oral or IV | |
| If rolapitant is used | 20 mg oral or IV | |
| Olanzapine | 10 mg oral | 10 mg oral on days 2-4 |

Ref : ASCO, 2017

ASCO® AMERICAN SOCIETY OF CLINICAL ONCOLOGY

# NCCN antiemesis guideline
## High emetic risk (including AC regimen)



| Day 1 | Day 2-4 |
|---|---|
| NK-1 antagonist<br>• Apprepitant 125 mg PO<br>• Fosaprepitant 150 mg IV<br>5-HT3 antagonist<br>• 1st gen<br>• Palonosetron 0.25 mg IV<br>Dexamethasone<br>• 12 mg IV/PO<br>• 20 mg IV/PO (w/o NK-1) | NK-1 antagonist<br>• Aprepitant 80 mg D2-3<br>(omitted for fosaprepitant)<br>Dexamethasone<br>• 8 mg PO D2-4 (for aprepitant)<br>• 8 mg PO D2 then 8 mg bid D3-4 (for fosaprepitant)<br>• 8 mg bid (w/o NK-1) |
| Netupitant 300 mg PO<br>Palonosetron 0.5 mg PO<br>Dexamethasone 12 mg IV/PO | Dexamethasone 8 mg PO D2-4 |
| Olanzapine 10 mg PO<br>Palonosetron 0.25 mg IV<br>Dexamethasone 20 mg PO | Olanzapine 10 mg PO D2-4 |

Ref : NCCN: Antiemetic. 2019.

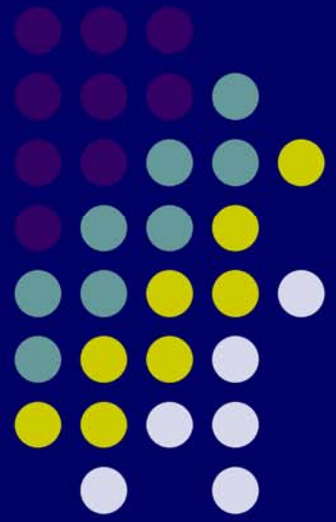
# NCCN antiemesis guideline
## High emetic risk (including AC regimen)

| Day 1 | Day 2-4 |
|---|---|
| Rolapitant 180 mg PO<br>5-HT3 antagonist<br>• 1st gen<br>• Palonosetron 0.25 mg IV<br>Dexamethasone 12 mg PO/IV | Dexamethasone 8 mg bid PO D2-4 |
| NK-1 antagonist<br>• Apprepitant 125 mg PO<br>• Fosaprepitant 150 mg IV<br>5-HT3 antagonist<br>• 1st gen<br>• Palonosetron 0.25 mg IV<br>Dexamethasone<br>• 12 mg IV/PO<br>• 20 mg IV/PO (w/o NK-1)<br>Olanzapine 10 mg PO | NK-1 antagonist<br>• Aprepitant 80 mg D2-3<br>(omitted for fosaprepitant)<br>Dexamethasone<br>• 8 mg PO D2-4<br>Olanzapine 10 mg PO D2-4 |

Ref : NCCN: Antiemetic. 2019.

# Quadruplet regimen for CINV in HEC (Part 2)

Manit Sae-teaw
B.Pharm, BCOP, BCP
Grad dip in Pharmacotherapy
Faculty of pharmaceutical sciences
Ubon Ratchathani University



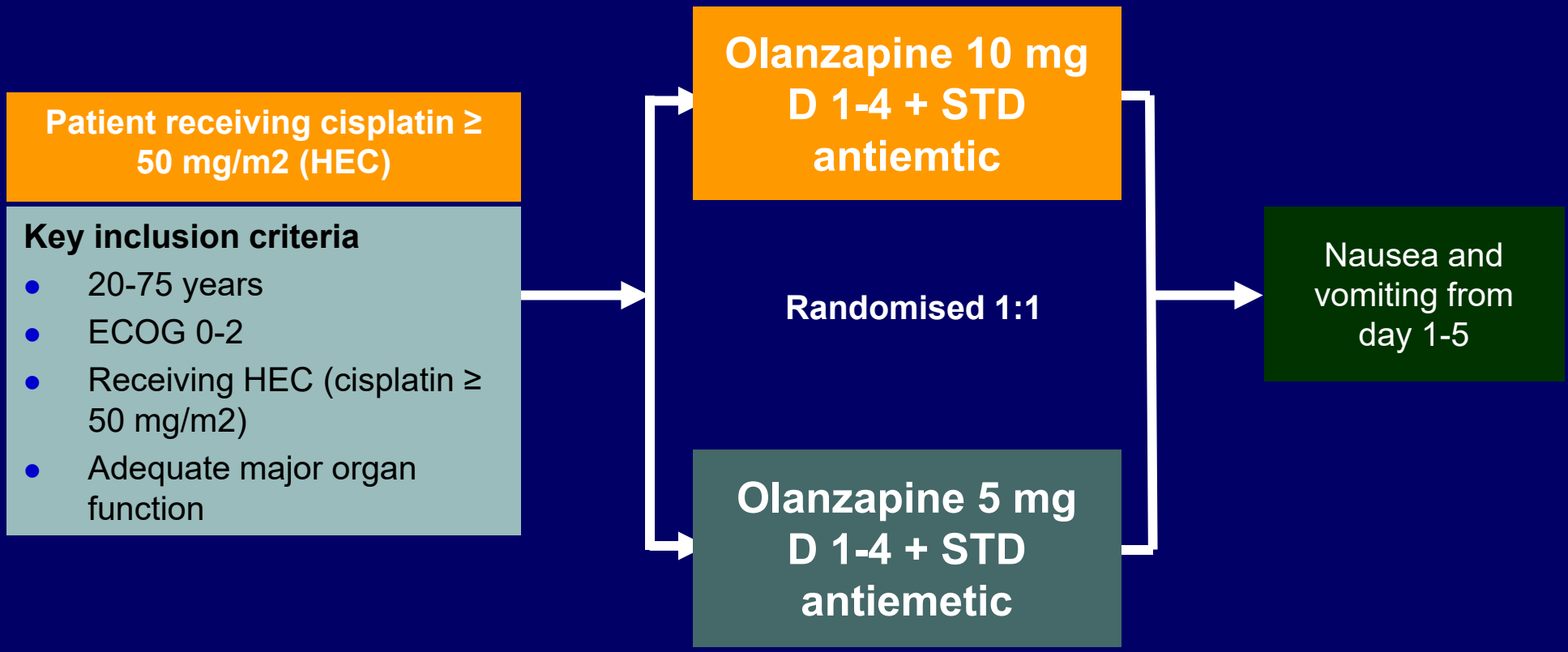
# Olanzapine 10 vs 5 mg

## Phase 2, double-blind study design

ORIGINAL ARTICLE

**A double-blind randomized phase II dose-finding study of olanzapine 10 mg or 5 mg for the prophylaxis of emesis induced by highly emetogenic cisplatin-based chemotherapy**

Takako Yanai[1] · Satoru Iwasa[2] · Hironobu Hashimoto[1] · Fumiyoshi Ohyanagi[3] · Tomomi Takiguchi[4] · Koji Takeda[5] · Masahiko Nakao[6] · Hiroshi Sakai[7] · Toshiaki Nakayama[8] · Koichi Minato[9] · Takahiro Arai[10] · Kenichi Suzuki[4] · Yasuhiro Shimada[11] · Kengo Nagashima[12] · Hiroyuki Terakado[1] · Noboru Yamamoto[2]




- **Primary endpoint: Complete response in delayed phase**
- **Secondary endpoint: complete response (overall, acute), adverse event**

**Ref : Yanai T, et al. Int J Clin Oncol 2018;23:382.**

| | 10 mg group ($n = 76$) | | | | 5 mg group ($n = 77$) | | | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | 80% C.I. | *P* value* | No. | % | 80% C.I. | *P* value* |
| Complete response (24–120 h) | 59 | 77.6 | 70.3–83.8 | 0.010 | 66 | 85.7 | 79.2–90.7 | < 0.001 |

| | 10 mg group ($n = 76$) | | | 5 mg group ($n = 77$) | | |
|---|---|---|---|---|---|---|
| | No. | % | 80% CI | No. | % | 80% CI |
| Complete response | | | | | | |
| Acute phase | 76 | 100.0 | 97.0–100.0 | 76 | 98.7 | 95.0–99.9 |
| Overall | 59 | 77.6 | 70.3–83.8 | 66 | 85.7 | 79.2–90.7 |
| Complete control[a] | | | | | | |
| Acute phase | 75 | 98.7 | 95.0–99.9 | 76 | 98.7 | 95.0–99.9 |
| Delayed phase | 59 | 77.6 | 70.3–83.8 | 64 | 83.1 | 76.3–88.5 |
| Overall | 58 | 76.3 | 68.9–82.6 | 64 | 83.1 | 76.3–88.5 |
| Total control[b] | | | | | | |
| Acute phase | 68 | 89.5 | 83.5–93.8 | 71 | 92.2 | 86.7–95.9 |
| Delayed phase | 47 | 61.8 | 53.9–69.3 | 50 | 64.9 | 57.1–72.2 |
| Overall | 45 | 59.2 | 51.2–66.8 | 48 | 62.3 | 54.4–69.7 |

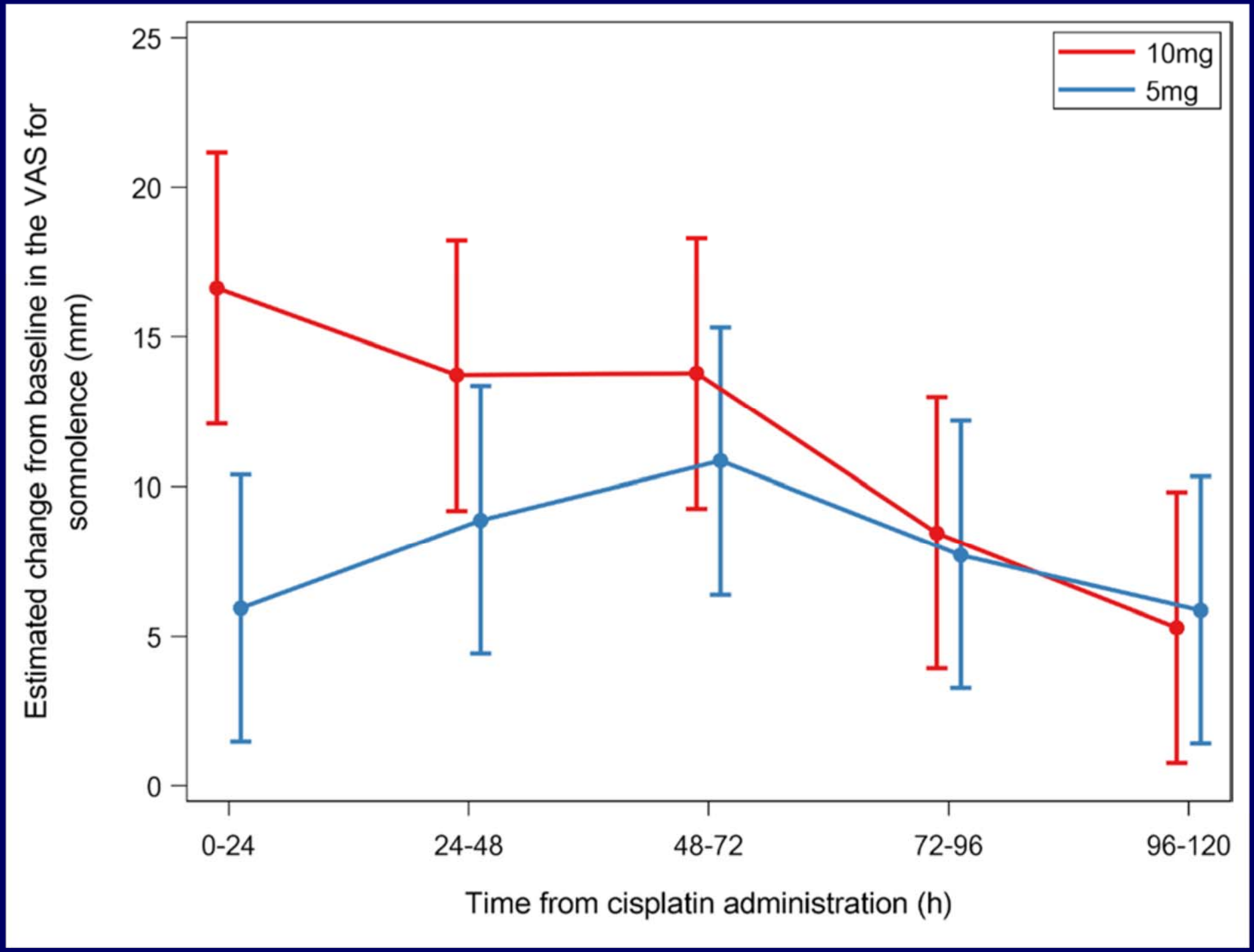
**Ref : Yanai T, et al. Int J Clin Oncol 2018;23:382.**

# Adverse events

| | 10 mg group ($n = 75$), no. (%) | | | 5 mg group ($n = 77$), no. (%) | | |
|---|---|---|---|---|---|---|
| | Grade 1 | Grade 2 | Grade 3 | Grade 1 | Grade 2 | Grade 3 |
| Somnolence | 39 (52.0) | 1 (1.3) | 0 (0) | 34 (44.2) | 1 (1.3) | 0 (0) |
| Constipation | 7 (9.3) | 3 (4.0) | 2 (2.7) | 10 (13.0) | 4 (5.2) | 1 (1.3) |
| ALT increased | 7 (9.5) | 2 (2.7) | 0 (0) | 8 (10.4) | 0 (0) | 0 (0) |
| Hiccups | 6 (8.0) | 0 (0) | 0 (0) | 3 (3.9) | 0 (0) | 0 (0) |
| Hyponatremia | 5 (6.8) | 0 (0) | 1 (1.4) | 3 (3.9) | 0 (0) | 1 (1.3) |
| Dry mouth | 5 (6.7) | 0 (0) | 0 (0) | 1 (1.3) | 0 (0) | 0 (0) |
| Hyperglycemia | 3 (4.1) | 0 (0) | 0 (0) | 4 (5.2) | 0 (0) | 0 (0) |
| Low Cl | 2 (2.7) | 0 (0) | 0 (0) | 1 (1.3) | 0 (0) | 0 (0) |
| Malaise | 2 (2.7) | 1 (1.3) | 0 (0) | 1 (1.3) | 0 (0) | 0 (0) |
| Fatigue | 0 (0) | 0 (0) | 0 (0) | 2 (2.6) | 0 (0) | 0 (0) |

No grade 4 adverse events were observed in both groups

Ref : Yanai T, et al. Int J Clin Oncol 2018;23:382.



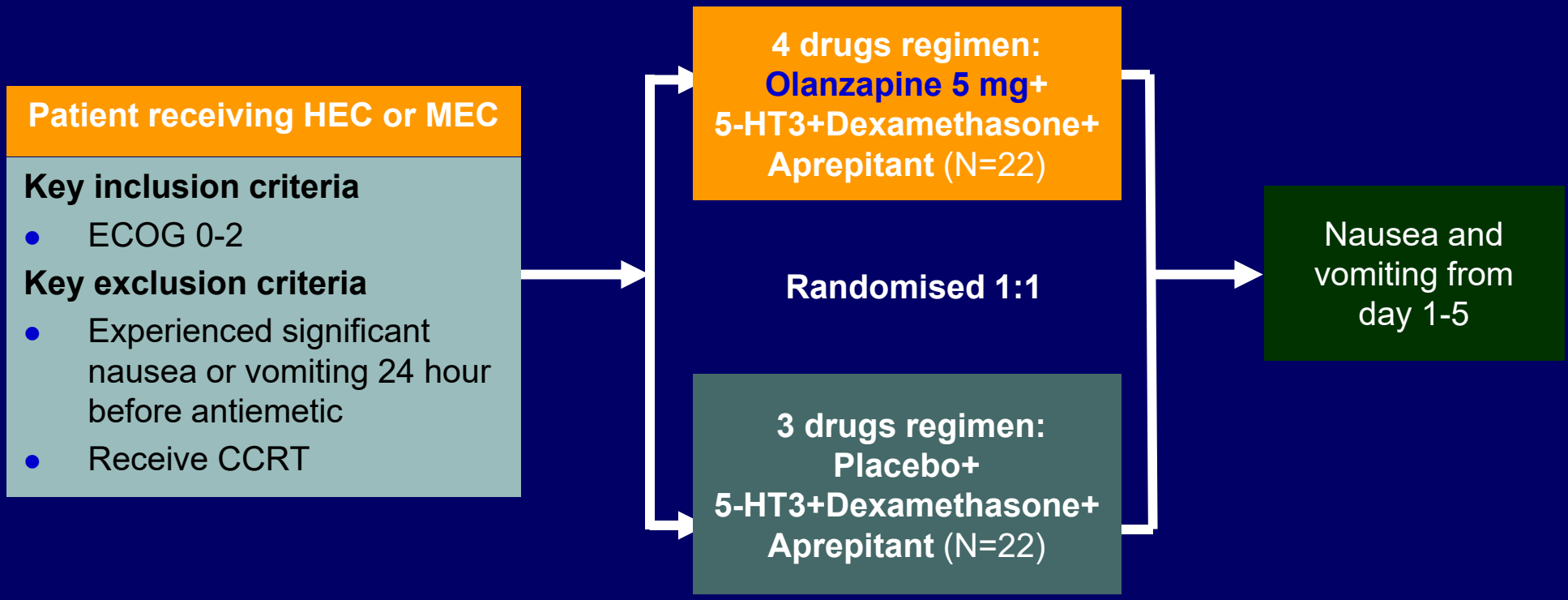

Ref : Yanai T, et al. Int J Clin Oncol 2018;23:382.

# Olanzapine prevent CINV

## Double-blind, randomized study design

*Original Article*

Olanzapine for the Prevention of Chemotherapy-Induced Nausea and Vomiting in Patients Receiving Highly or Moderately Emetogenic Chemotherapy: A Randomized, Double-Blind, Placebo-Controlled Study




- **Primary endpoint: Total control (No vomiting, No rescue med, Nausea ≤ 5/100 VAS)**
- **Secondary endpoint: QOL (FLI-E) (score 18-126; Lower is better), response**

**Ref : Mizukami N, et al. J Pain Symptom Manage 2014;47:542.**

# Antiemetic response

| Efficacy Endpoints | OL Group, *n* (%) | Control Group, *n* (%) | *P*-Value | Odds Ratio (95% CI) |
|---|---|---|---|---|
| TC | | | | |
| Acute phase | 19 (86) | 12 (55) | 0.045[a] | 5.28 (1.20–23.17) |
| Delayed phase | 14 (64) | 5 (23) | 0.014[a] | 5.95 (1.59–22.33) |
| Overall phase | 13 (59) | 5 (23) | 0.031[a] | 4.91 (1.32–18.21) |
| Complete protection | | | | |
| Acute phase | 22 (100) | 14 (64) | 0.004[a] | 26.38 (1.41–493.2) |
| Delayed phase | 19 (86) | 11 (50) | 0.022[a] | 6.33 (1.45–27.74) |
| Overall phase | 19 (86) | 10 (45) | 0.009[a] | 7.60 (1.73–33.36) |
| Complete response | | | | |
| Acute phase | 22 (100) | 19 (86) | 0.233 | 8.08 (0.39–166.4) |
| Delayed phase | 22 (100) | 16 (73) | 0.021[a] | 17.73 (0.93–337.5) |
| Overall phase | 22 (100) | 15 (68) | 0.009[a] | 21.77 (1.16–410.1) |

TC = total control; CP = complete protection; CR = complete response.
[a]$P < 0.05$ vs. the control group.

**Complete response (CR)** = No vomiting, No rescue med
**Complete protection (CP)** = CR + Nausea ≤ 25/100 VAS
**Total control (TC)** = CR + Nausea ≤ 5/100 VASc

Ref : Mizukami N, et al. J Pain Symptom Manage 2014;47:542.

# Patient-Reported Outcome

**Estimation of Efficacy and Effect of Olanzapine on Day 6**

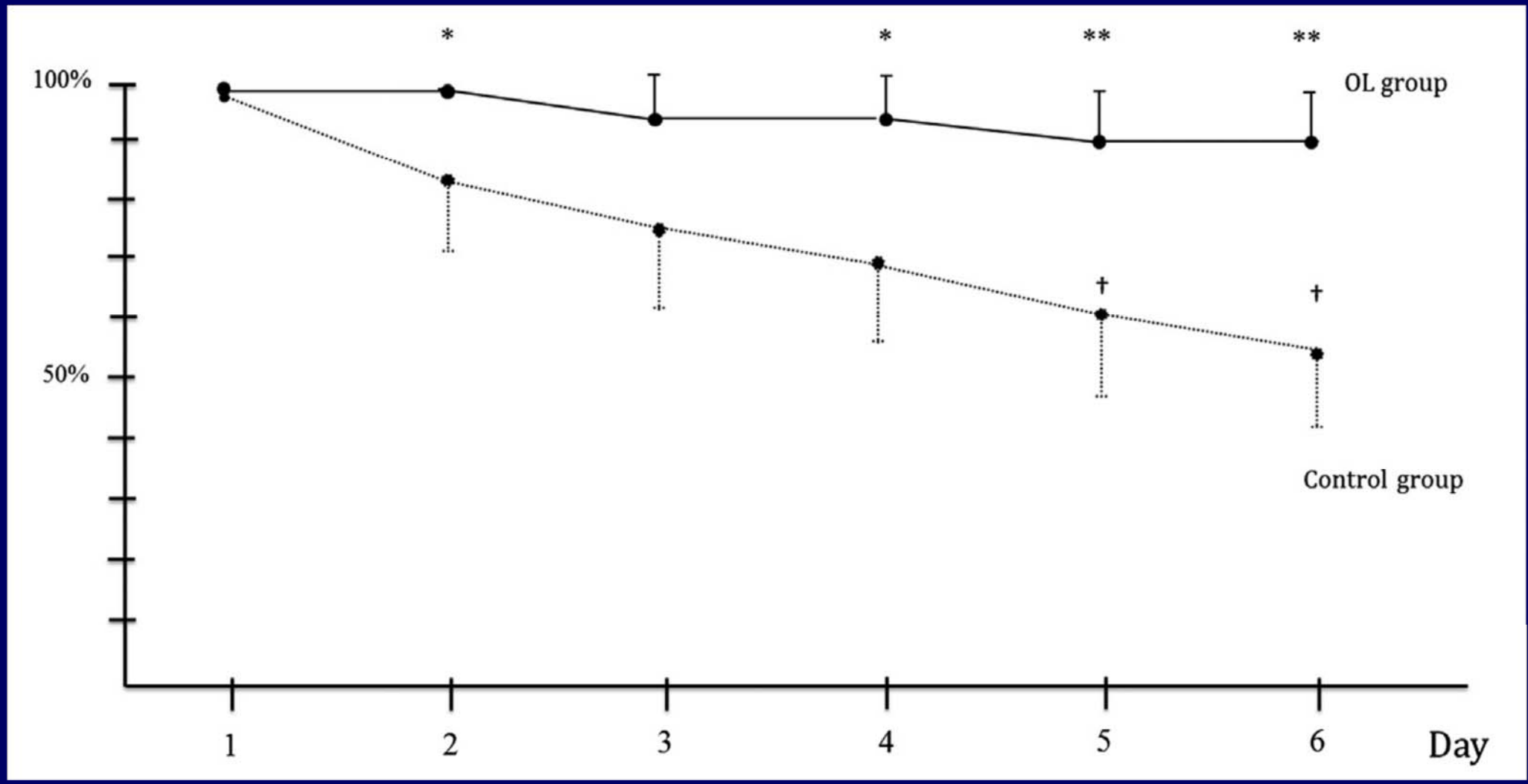
| Patient-Reported Outcome Measure | OL Group | Control Group | *P* |
|---|---|---|---|
| FLI-E score[a] | 18 (18–20) | 26 (20–40) | 0.0004[c] |
| VAS (mm)[a] | | | |
| Acute phase | 0 (0–0) | 0 (0–50) | 0.0211[c] |
| Delayed phase | 0 (0–20) | 20 (0–50) | 0.0036[c] |
| Satisfaction level[a] | 5 (4–5) | 3 (3–4) | <0.0001[c] |
| Wish to use the drug in the next cycle as well[b] | 20 (91) | 14 (64) | 0.0689 |

FLI-E = Functional Living Index-Emesis; VAS = visual analogue scale.
[a]Median (interquartile range): Mann-Whitney's analysis.
[b]The number of patients (%): Fisher's exact test.
[c]$P < 0.05$ vs. the control group.

**No serious adverse events were observed!!!**

Ref : Mizukami N, et al. J Pain Symptom Manage 2014;47:542.

# Change in dietary intake (During chemotherapy)




Ref : Mizukami N, et al. J Pain Symptom Manage 2014;47:542.

# Compare antiemetic in HEC

## Systematic review and network meta-analysis


**MEDLINE and Cochrane (last October 2017)**

**Key inclusion criteria**

- Randomized trial
- High Emetogenic Chemotherapy (HEC)

**Key exclusion criteria**

- Pediatric
- Emetic caused by Surgery and RT

- **Direct comparison btw antiemetic regimen**
- **Multiple treatment meta-analysis and netwok meta-analysis**

**27 RCTs with 13,356 pts**

- Direct compare 7 regimens
- Indirect compare 12 regimens

- **Primary endpoint: Complete response (No emesis+no recue medication)**
- **Secondary endpoint: adverse effect**

**Ref : Yokoe T, et al. Oncologist 2019;24:e347.**

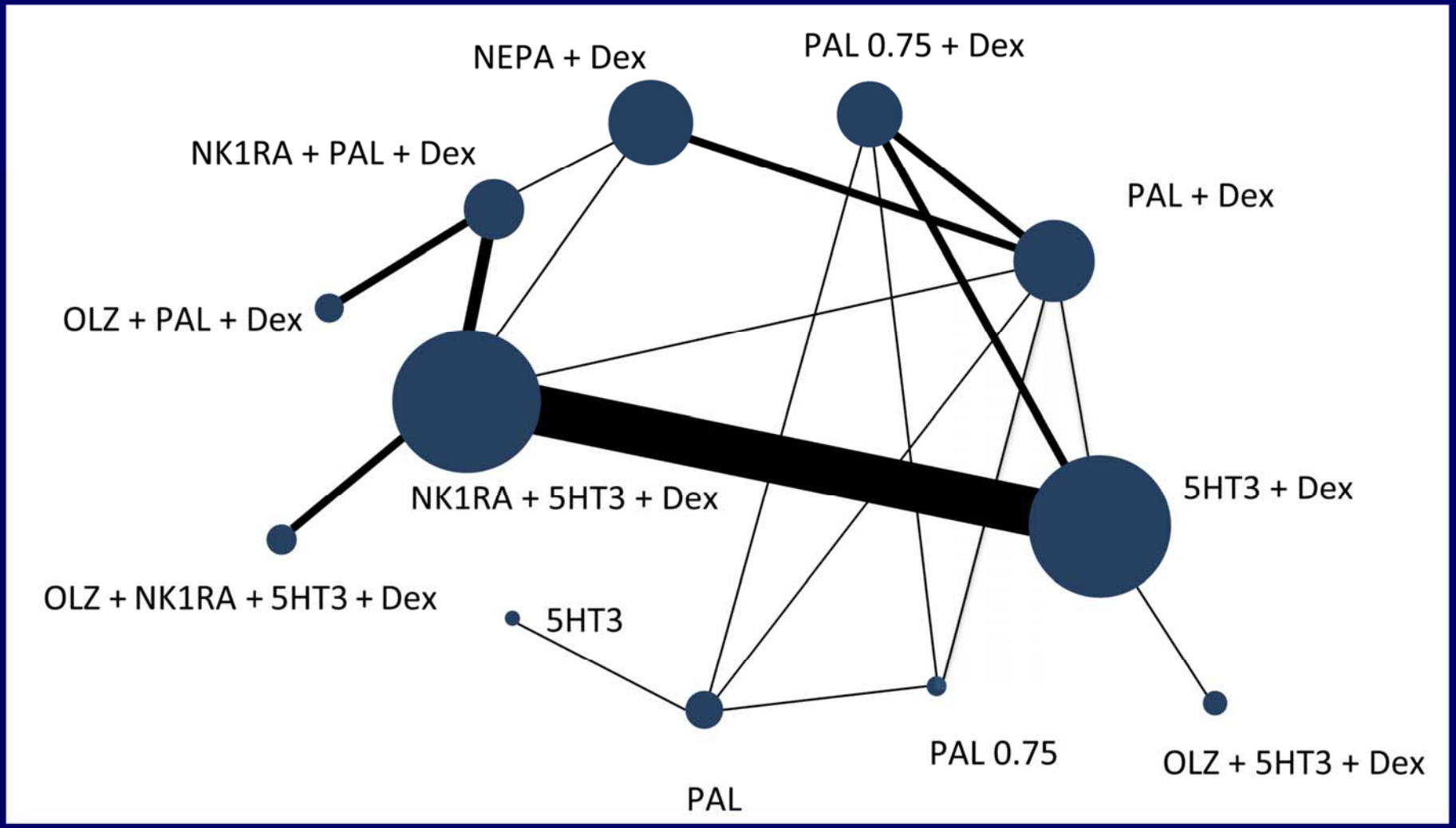
# Direct comparison (CR)

| Type of response | Reference | Treatment arm | Number of studies | Odds ratio [95% CI][a] |
|---|---|---|---|---|
| Overall CR | 5HT3 + Dex | NK1RA + 5HT3 + Dex | 12 | 1.75 [1.58–1.94] |
| Overall CR | 5HT3 + Dex | PAL0.75 + Dex | 2 | 1.53 [1.25–1.87] |
| Overall CR | PAL + Dex | NEPA + Dex | 2 | 1.73 [1.11–2.68] |
| Overall CR | PAL + Dex | PAL0.75 + Dex | 2 | 1.01 [0.75–1.37] |
| Overall CR | NK1RA + 5HT3 + Dex | NK1RA + PAL + Dex | 3 | 1.36 [1.04–1.79] |
| Overall CR | NK1RA + PAL + Dex | OLZ + PAL + Dex | 2 | 1.11 [0.67–1.83] |
| Overall CR | NK1RA + 5HT3 + Dex | OLZ + NK1RA + 5HT3 + Dex | 2 | 4.53 [0.69–29.68] |
| Acute CR | 5HT3 + Dex | NK1RA + 5HT3 + Dex | 10 | 1.85 [1.53–2.24] |
| Delayed CR | 5HT3 + Dex | NK1RA + 5HT3 + Dex | 10 | 1.81 [1.54–2.13] |

**Complete response in triplet regimen 43.75% compare with quadruplet regimen 67.9%**

Ref : Yokoe T, et al. Oncologist 2019;24:e347.

# Indirect comparison (CR)



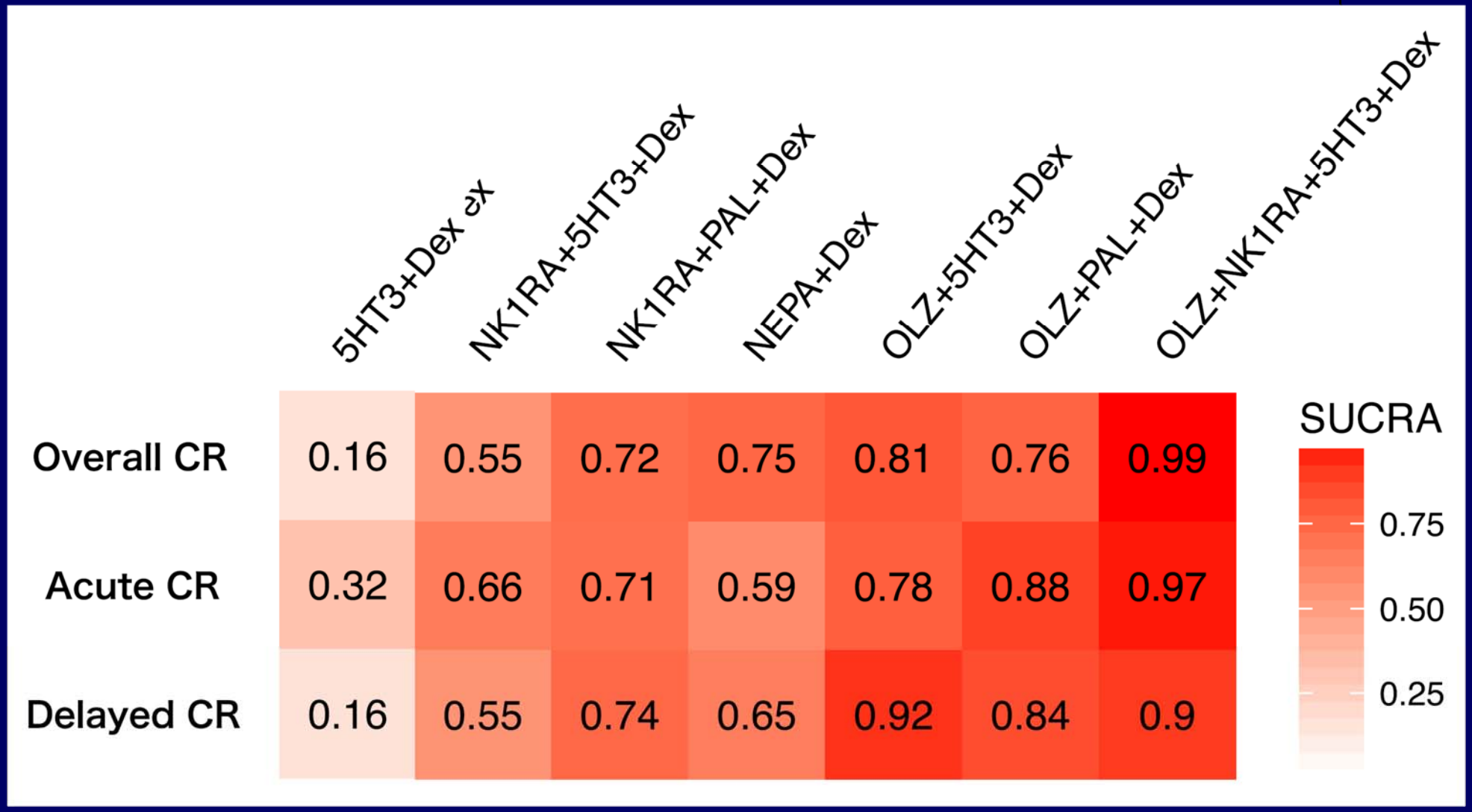

Ref : Yokoe T, et al. Oncologist 2019;24:e347.

# Efficacy (CR) of quadruplet regimen

| Comparing regimen | Odd ratio |
|---|---|
| 5HT3 + Dexa | 4.88 (3.02-7.92) |
| 5HT3 | 6.37 (2.31-19.08) |
| Palonosetron | 4.26 (2.23-8.27) |
| PAL+Dex | 3.37 (1.93-5.94) |
| PAL0.75 | 5.77 (2.71-12.02) |
| PAL0.75+Dex | 3.22 (1.92-5.58) |
| NK1RA+5HT3+Dex | 2.77 (1.72-4.44) |
| NK1RA+PAL+Dex | 2.17 (1.25-3.75) |
| NEPA+Dex | 2.07 (1.18-3.69) |
| OLZ+5HT3+Dex | 1.76 (0.78-3.87) |
| OLZ+PAL+Dex | 1.96 (0.93-4.34) |

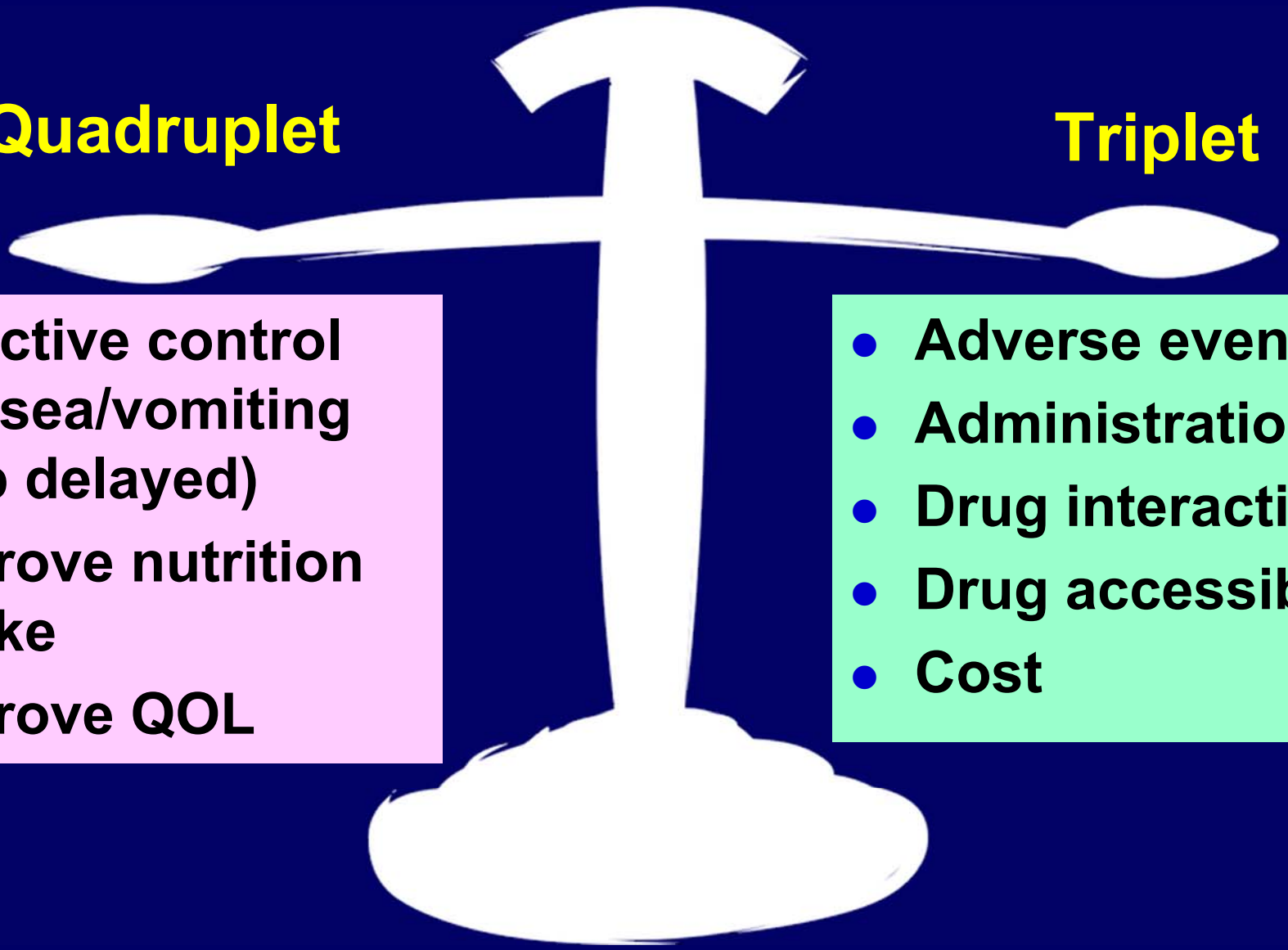
Ref : Yokoe T, et al. Oncologist 2019;24:e347.

# Efficacy assess by SUCRA




Ref : Yokoe T, et al. Oncologist 2019;24:e347.

# Summary
# Quadruplet vs Triplet antiemetic



## Quadruplet

- Effective control Nausea/vomiting (esp delayed)
- Improve nutrition intake
- Improve QOL

## Triplet

- Adverse events
- Administration
- Drug interaction
- Drug accessibility
- Cost