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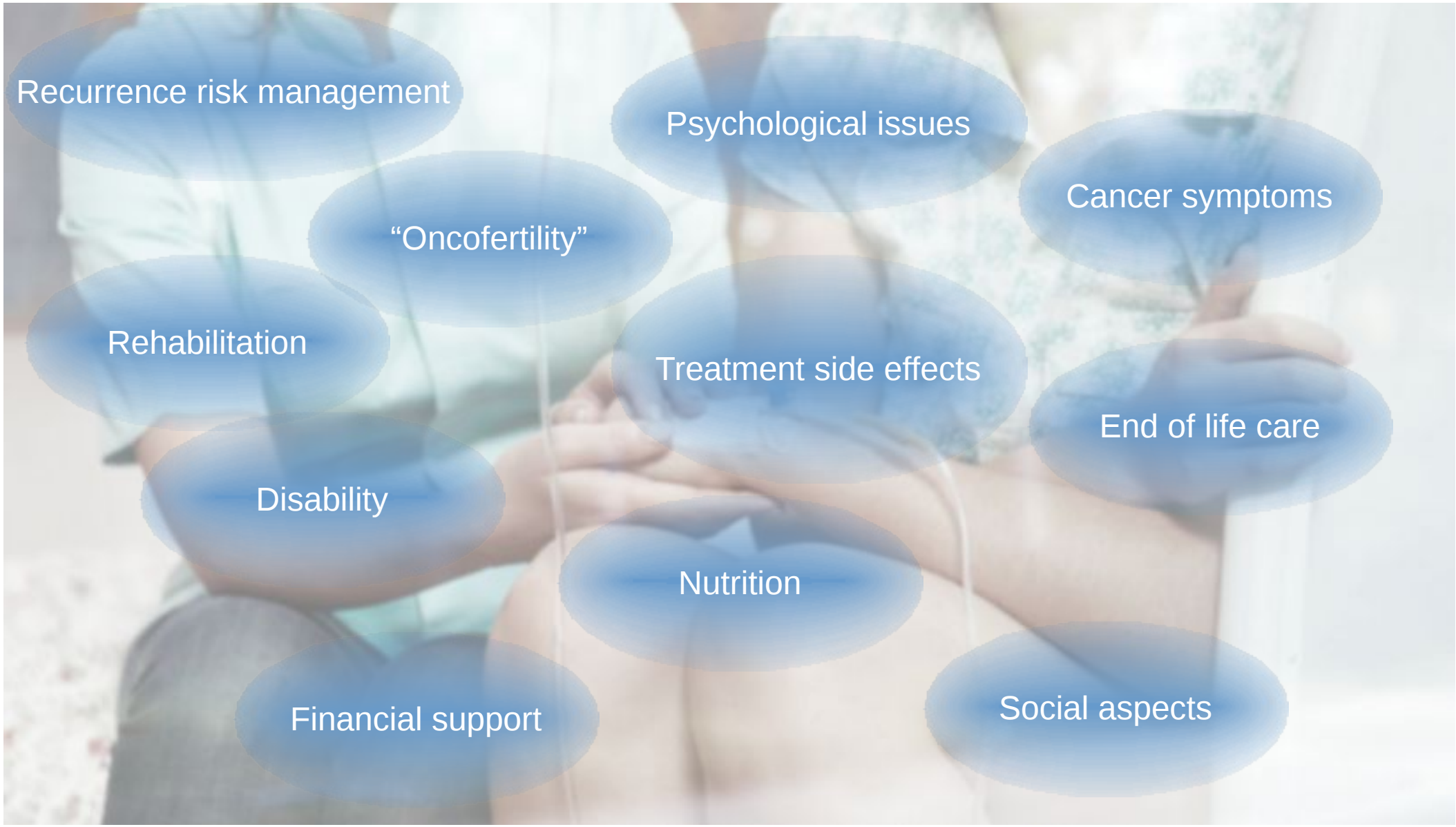
Supportive care in oncology

Paweł Potocki, MD

Jagiellonian University Medical College
Kraków University Hospital
Departament of Clinical Oncology

pawel.potocki@uj.edu.pl

Supportive care – a complex issue



Supportive care – basic ideas

- Commonly thought interchangeable
  - Symptom management
  - Supportive care
  - Palliative care
  - Hospice care
  - Complementary care
- Do NOT mean the same thing

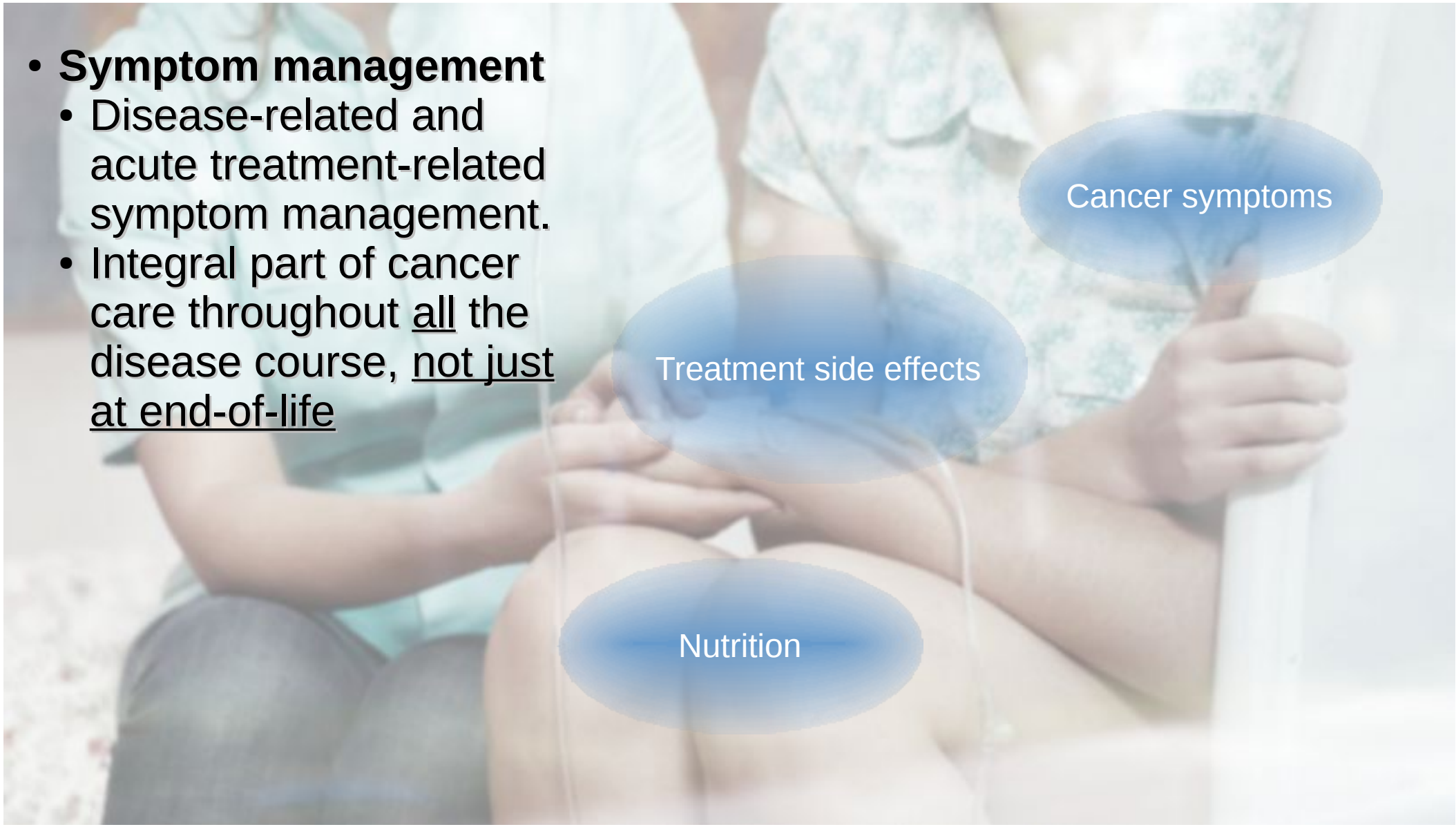
Supportive care – basic ideas

palliative ≠ end of life

palliative treatment ≠ best supportive care

palliative care > pain management

Supportive care – focal points



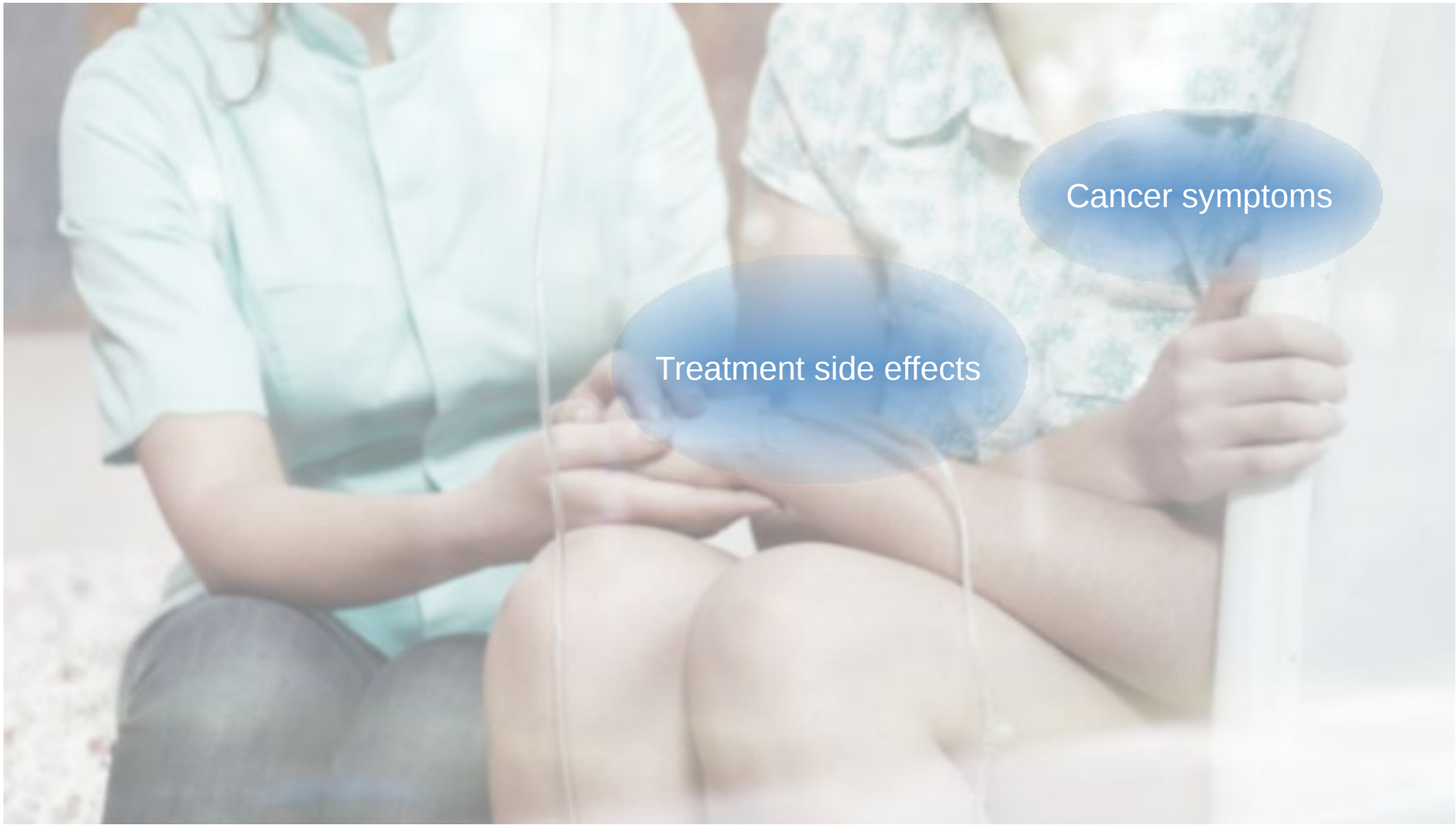
- **Symptom management**
  - Disease-related and acute treatment-related symptom management.
  - Integral part of cancer care throughout all the disease course, not just at end-of-life

Supportive care – focal points

Supportive care – focal points

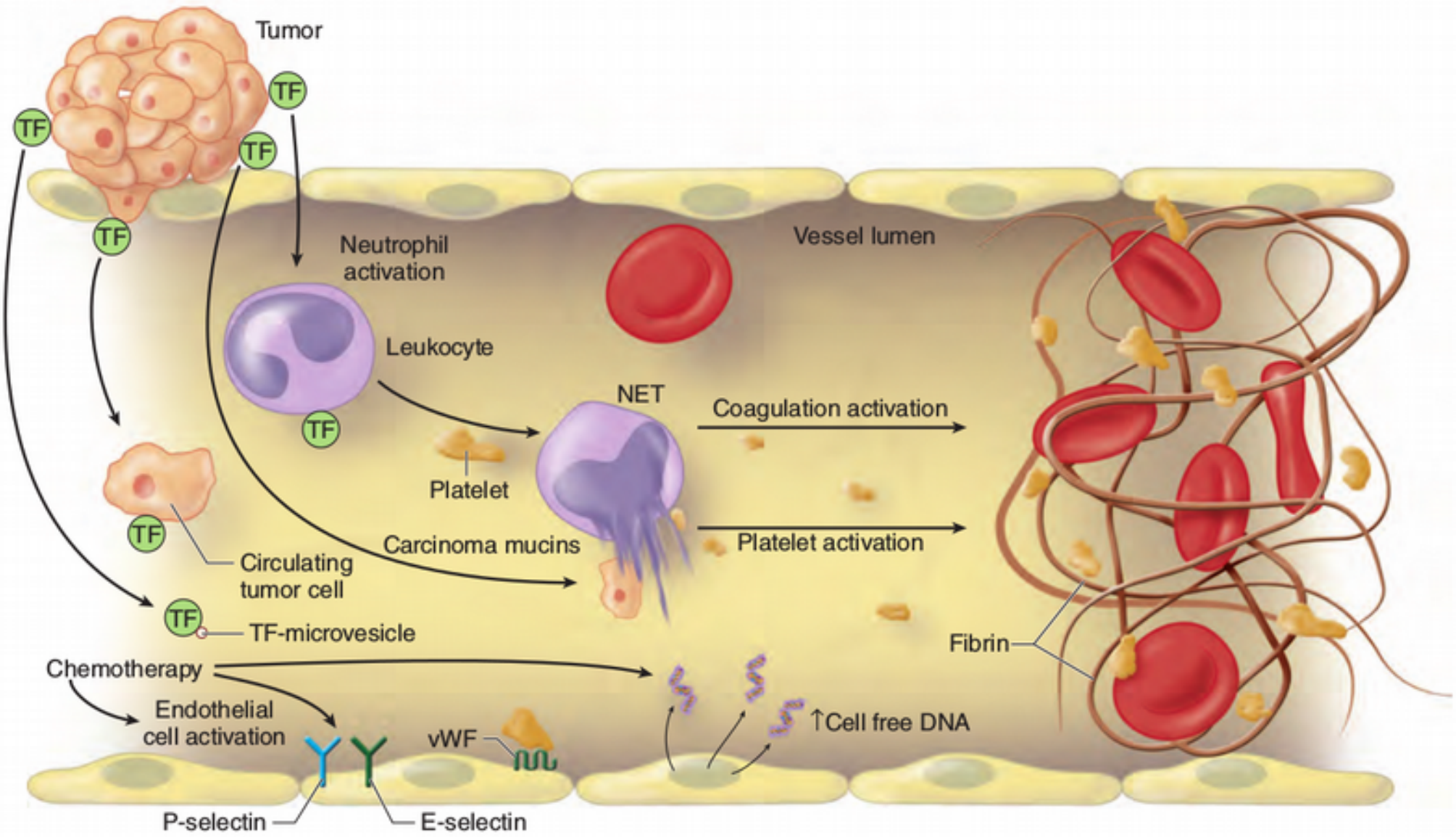
- **Survivorship**
  - Late treatment-related symptom management.
  - Rehabilitation
  - Re-adaptation
  - Complex challenges

This seminar



Venous thromboembolism (VTE)

VTE - patomechanism



Proposed mechanisms for cancer-associated thrombosis. Multiple mechanisms have been postulated including tissue factor upregulation on tumor cell surface as well as release associated with microvesicles into the systemic circulation, platelet activation by carcinoma mucins and other factors, endothelial cell activation by chemotherapy, release of cell-free DNA by chemotherapy, and formation of neutrophil extracellular traps.

VTE – 1st episode epidemiology

Seasonal Variation	Possibly more common in winter and less common in summer
Risk Factors	25% to 50% “idiopathic” 15%-25% associated with cancer 20% following surgery (3 months)
Recurrent VTE	6-month incidence, 7%; Higher rate in patients with cancer Recurrent PE more likely after PE than after DVT
Death After Treated VTE	30-day incidence 6% after incident DVT 30-day incidence 12% after PE Death strongly associated with cancer, age, and cardiovascular disease

White R. *Circulation*. 2003;107:I-4 –I-8.)

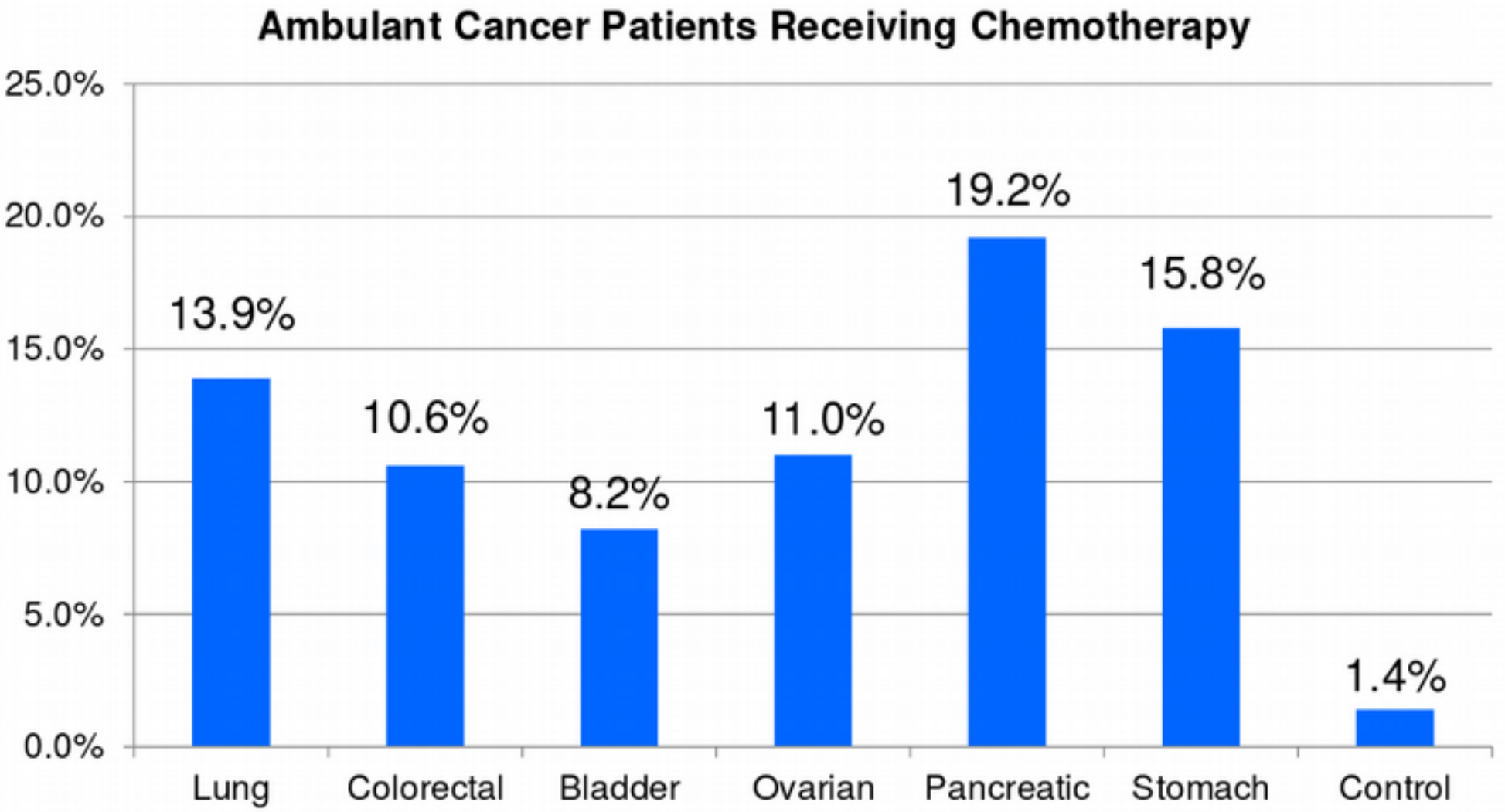
VTE – underlying cause

- Hospitalization for surgery or medical 24%/22%
- Malignant neoplasm 18%
- Trauma 12%
- Congestive heart failure 10%
- Central venous catheter or pacemaker 9%
- Neurological disorder with extremity paresis 7%
- Superficial vein thrombosis 5%

VTE – risk factors

- Previous or current DVT
- Immobilization
- Surgery within the last 3 months
- Stroke/paralysis
- Central venous instrumentation within the last 3 months
- Malignancy
- CHF
- Autoimmune diseases
- Thrombophillias
- In Women
  - Obesity (BMI ≥29)
  - Pregnancy
  - Heavy cigarette smoking (>25 cigarettes per day)
  - Hypertension

VTE – risk by cancer type



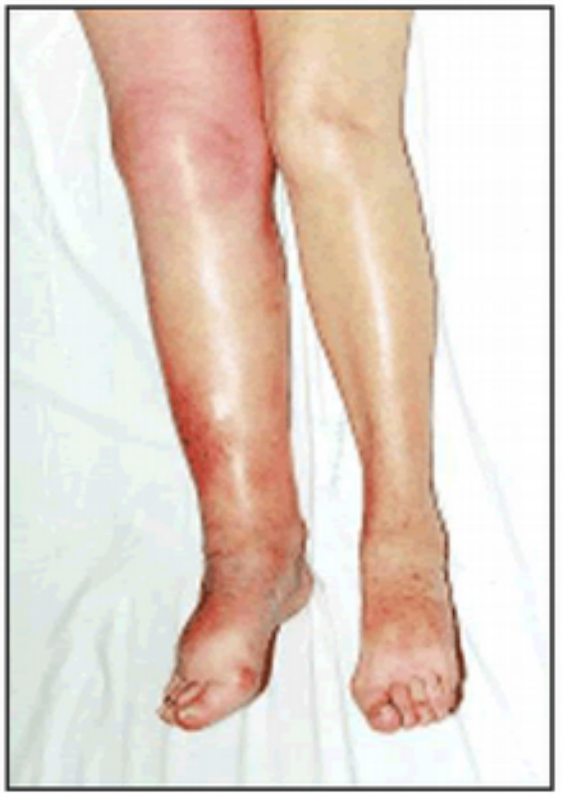
Khorana AA, *Cancer* 2013;119:648-655

VTE – presentation and workup

DVT

- unilateral
- swelling
- pain
- discoloration
- pitting edema
- mild fever

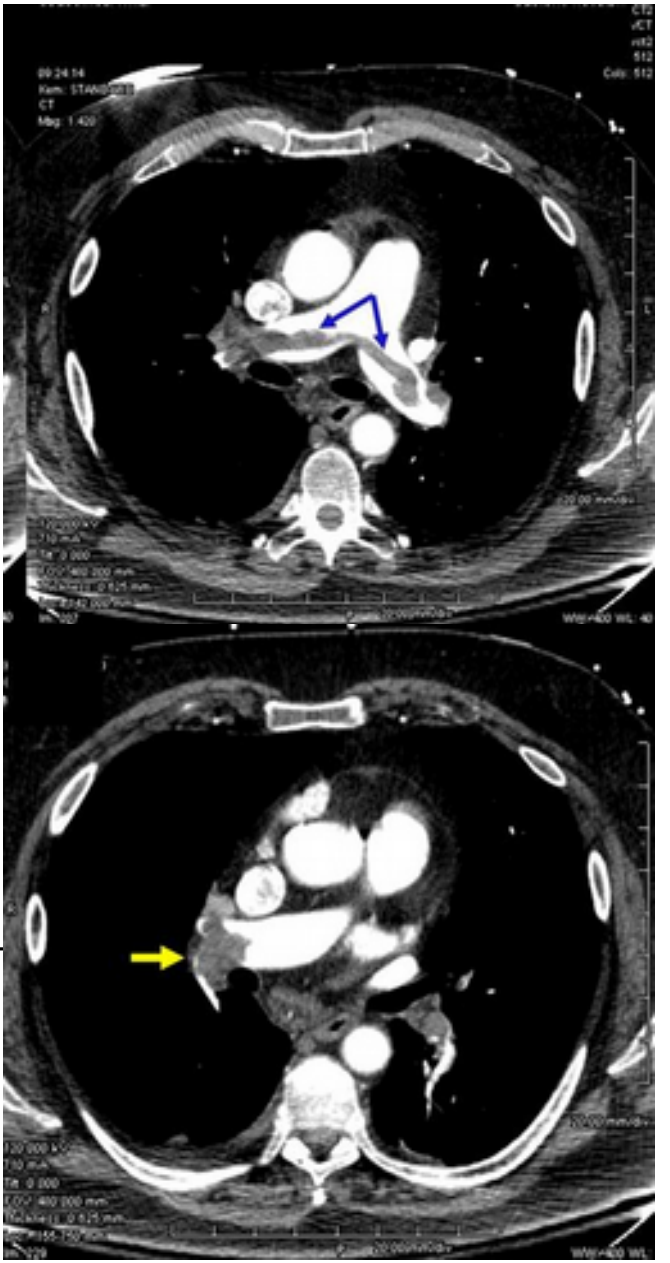
- Workup
  - physical
  - vein ultrasound



PE

- shortness of breath
- cough
- chest pain
- tachycardia
- hypotension
- mild fever
- hemoptysis

- Workup
  - differential
  - underlying DVT
  - angio-CT
  - cardiac ultrasound



VTE - Well's score

Clinical symptoms of DVT (leg swelling, pain with palpation)	3.0
Other diagnosis less likely than pulmonary embolism	3.0
Heart rate >100	1.5
Immobilization (≥3 days) or surgery in the previous four weeks	1.5
Previous DVT/PE	1.5
Hemoptysis	1.0
Malignancy	1.0

Traditional clinical probability assessment (Wells criteria)	
High	>6.0
Moderate	2.0 to 6.0
Low	<2.0

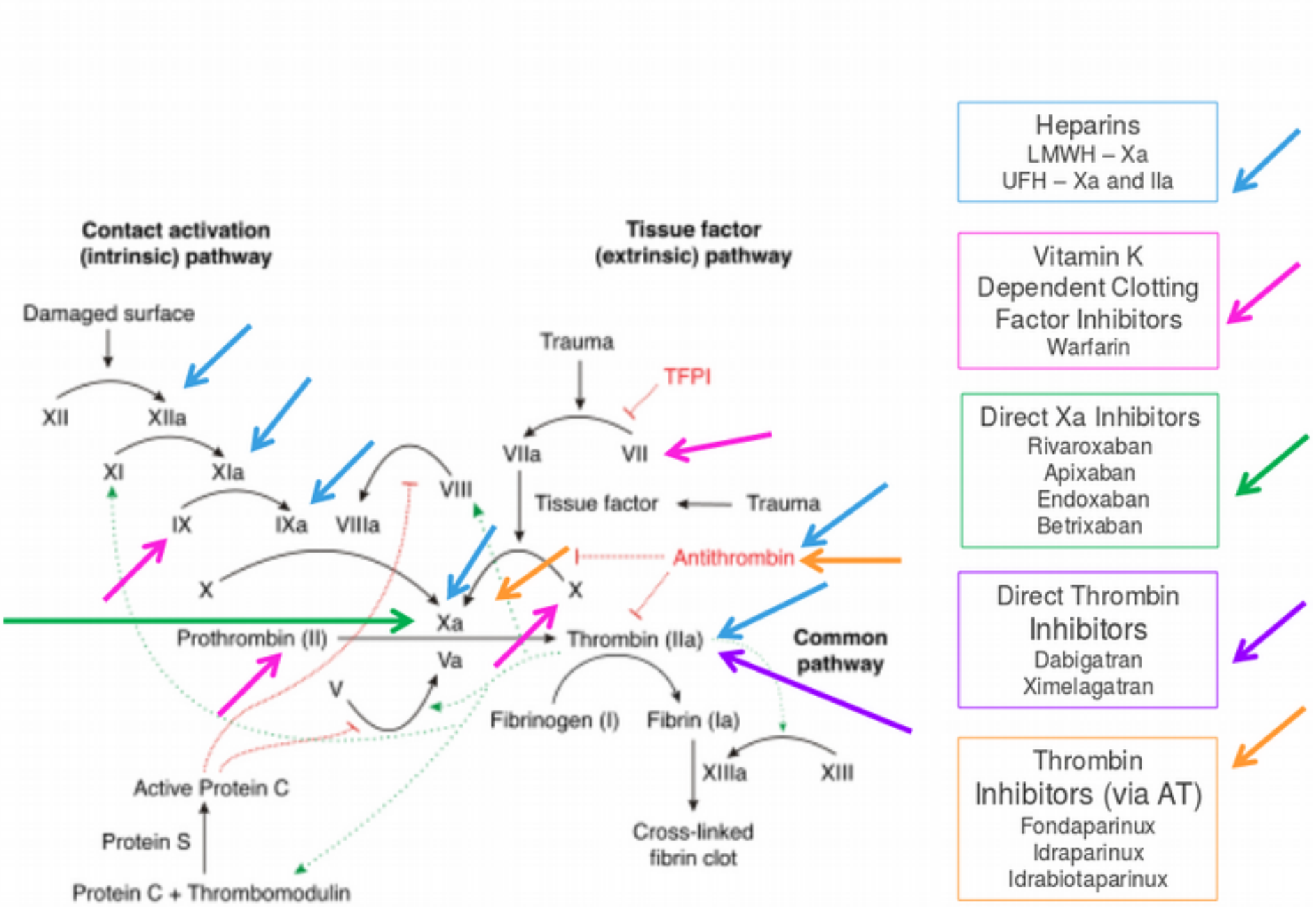
Simplified clinical probability assessment (Modified Wells criteria)	
PE likely	>4.0
PE unlikely	≤4.0

VTE – management

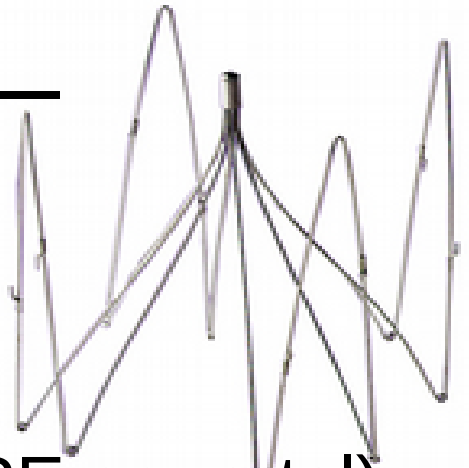
Treatment modalities

Pharmacological	Mechanical
Heparins	Mobilization
• LMWH: enoxaparin, dalteparin, tinzaparin	Electrical calf stimulation (ECS)
• Pentasaccharides: Fondiparinux	Intermittent pneumatic compression (IPC)
• UFH	Graduated compression stockings (GCS - e.g. TEDs)
• ULMWH: semuloparin	Venous foot pump devices
VKA: warfarin	IVC filters
Direct FXa inhibitors	
Direct thrombin inhibitors	

VTE – management



VTE in cancer patiens– management

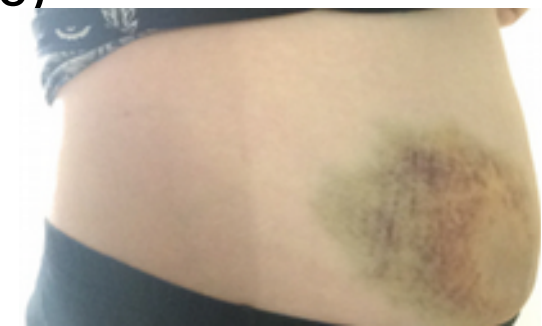


- Heparins – therapeutic doses
- Thrombolysis – when massive (ie bilateral PE or portal)
- Supportive treatment

- Inferior vena cava filter if heparins contraindicated

Contraindicated in cancer patients:

- vitamin K antagonists - very high potential for interactions with anticancer drugs.
- new oral anticoagulants (dabigatran, rivaroxaban etc)
  - potential for interactions not sufficiently explored
  - effects hard to reverse



VTE – management

Treatment duration

Absence of ongoing risk factors: minimum duration

- **Distal vs proximal leg TE**
  - 3 vs 6 months
- **Pulmonary embolus**
  - 12 months
- **CVAD-related**
  - While in situ +
  - 3 months
- **Upper limb: non-CVAD-related**
  - 3 months
- **"Indefinite"**

Additional / ongoing risk factors: duration of risk…and a bit more

- **Risk factors**
  - Presence of the cancer (bulk)
  - Ongoing anti-cancer therapy
  - Surgery
  - Hospitalisation
  - Indwelling CVAD/PICC
  - Lymphatic/venous incompetence
  - Infections
  - Comorbidities

VTE – prophylaxis

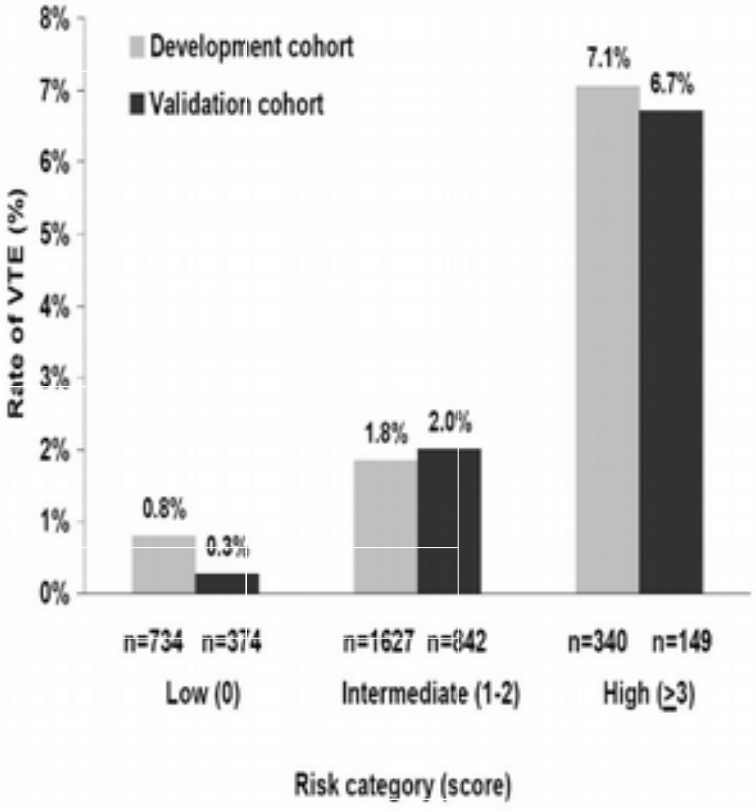
Risk assessment for hospitalized patients – Padva score

Risk Factor	**Points**
Active Cancer	3
Previous VTE w*ith exclusion of superficial vein thrombosis*	3
Reduced Mobility	3
Already known thrombophilic condition of *antithrombin, protein C or S, factor V Leiden, antiphospholipid syndrome*	3
Recent (< 1 month) trauma and/or surgery	2
Elderly age (> 70 y)	1
Heart and/or Respiratory failure	1
Acute myocardial Infarction or ischemic stroke	1
Acute Infection or rheumatologic disorder	1
Obesity (BMI > 30)	1
Ongoing hormonal treatment	1
High risk is defined by a cumulative score ≥4 and low risk <4	

VTE – prophylaxis

Risk for inpatients – Khorana score

Patient characteristic	Risk score
Site of cancer	
Very high risk (stomach, pancreas)	2
High risk (lung, lymphoma, gynecologic, bladder, testicular)	1
Prechemotherapy platelet count 350 × 10^9/L or more	1
Hemoglobin level less than 100 g/L or use of red cell growth factors	1
Prechemotherapy leukocyte count more than 11 × 10^9/L	1
BMI 35 kg/m^2 or more	1



Khorana et al, Blood 2008

VTE – prophylaxis

Risk for inpatients – Vienna CATS score

Site of cancer	
very high risk (stomach, pancreas, brain)	2
high risk (lung, lymphoma, kidney, myeloma)	1
Platelet count 350x10⁹/L or more	1
Hemoglobin less than 10 g/dL and/or use of erythropoiesis-stimulating agents	1
Leukocyte count more than 11x10⁹/L	1
BMI of 35 kg/m² or more	1
Soluble P-selectin 53.1 ng/mL or more	1
D-Dimer 1.44 µg/mL or more	1

points	risk
≥5	35%
4	25%
3	14%
1-2	5-7%
0	1%

Ay et al, Blood 2010

VTE – prophylaxis

Utilisation among high risk cancer patients

- **ESSENTIAL study 2009** Kalka et al. Thromb Haemost 2009
  - Among 1046 patients undergoing high risk cancer surgery, <50% utilisation of extended TP
- **Cancer Surgery Study 2011** Lee et al. Ann Surg 2011
  - Among 252,950 cancer surgeries 46% received TP
- **CSSANZ Survey 2012** Smart et al. ANZ J Surg 2013
  - Among 128 colorectal surgeons 54% prescribe TP after hospital discharge. Lack of data, absence of recommendations and logistical issues prevent use in the neoadjuvant and post-discharge settings.
- **ALTG Survey 2013** Alexander et al. JSCC 2014
  - Among 157 lung cancer clinicians 91% reported access to institutional guidelines yet only 65% included risk stratification and 2% had recommendations for ambulatory care settings.
- **Patient survey 2010** Sousou et al. Cancer Invest 2010
  - Among 190 cancer patients, 53% were unaware of the risk of TE yet 86% were willing to receive oral and 46% parenteral prophylaxis

UNDERUSED

VTE – prophylaxis

- Risk based strategy
- Local guidelines (state/institution level)

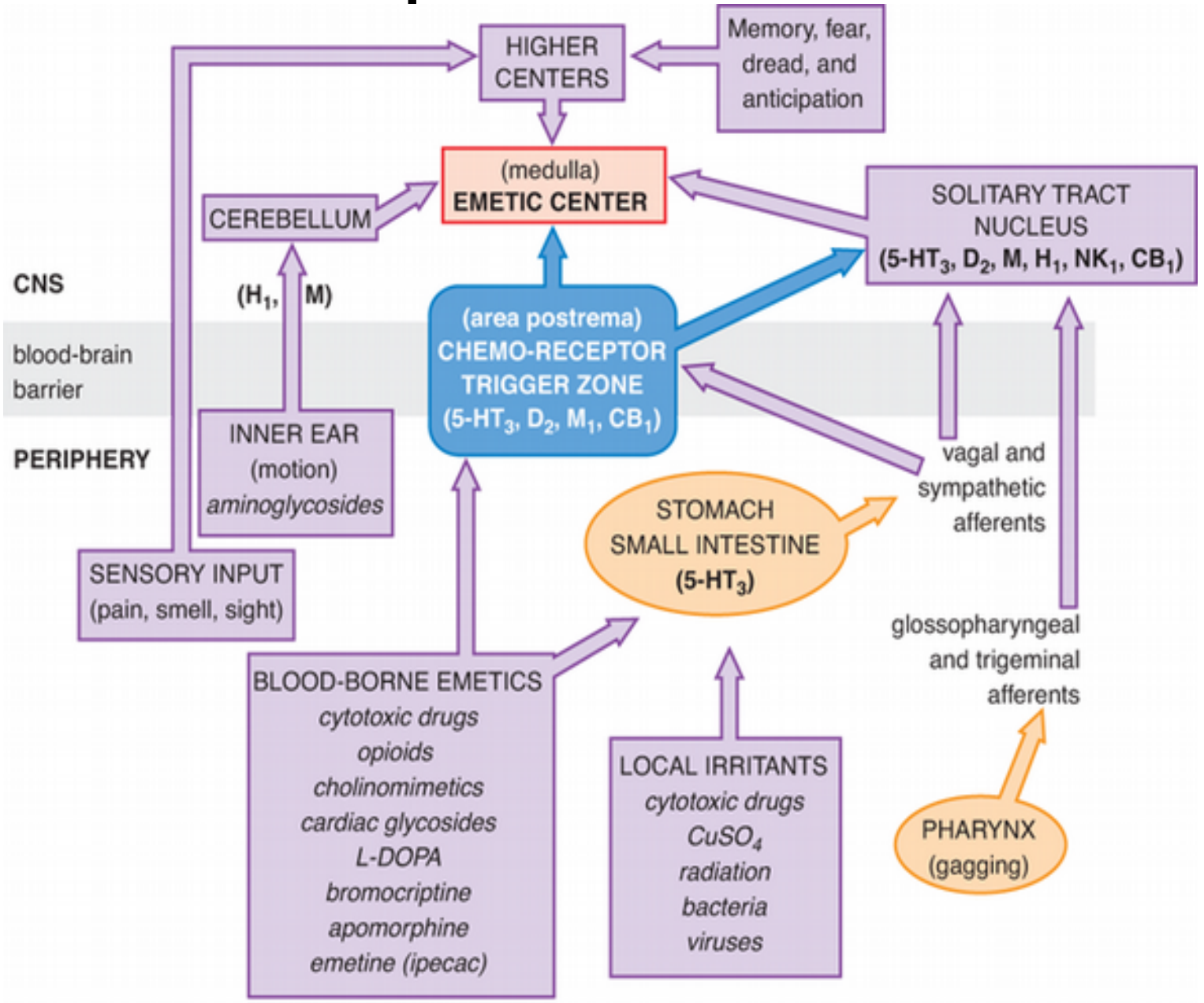
- Reduce risk factors
- LMWH – prophylactic dose
  (ie. enoxaparin 1mg/kg daily)

Questions?

Chemotherapy induced nausea and vomiting (CINV)

CINV – the most feared chemotherapy toxicity

CINV - patomechanism

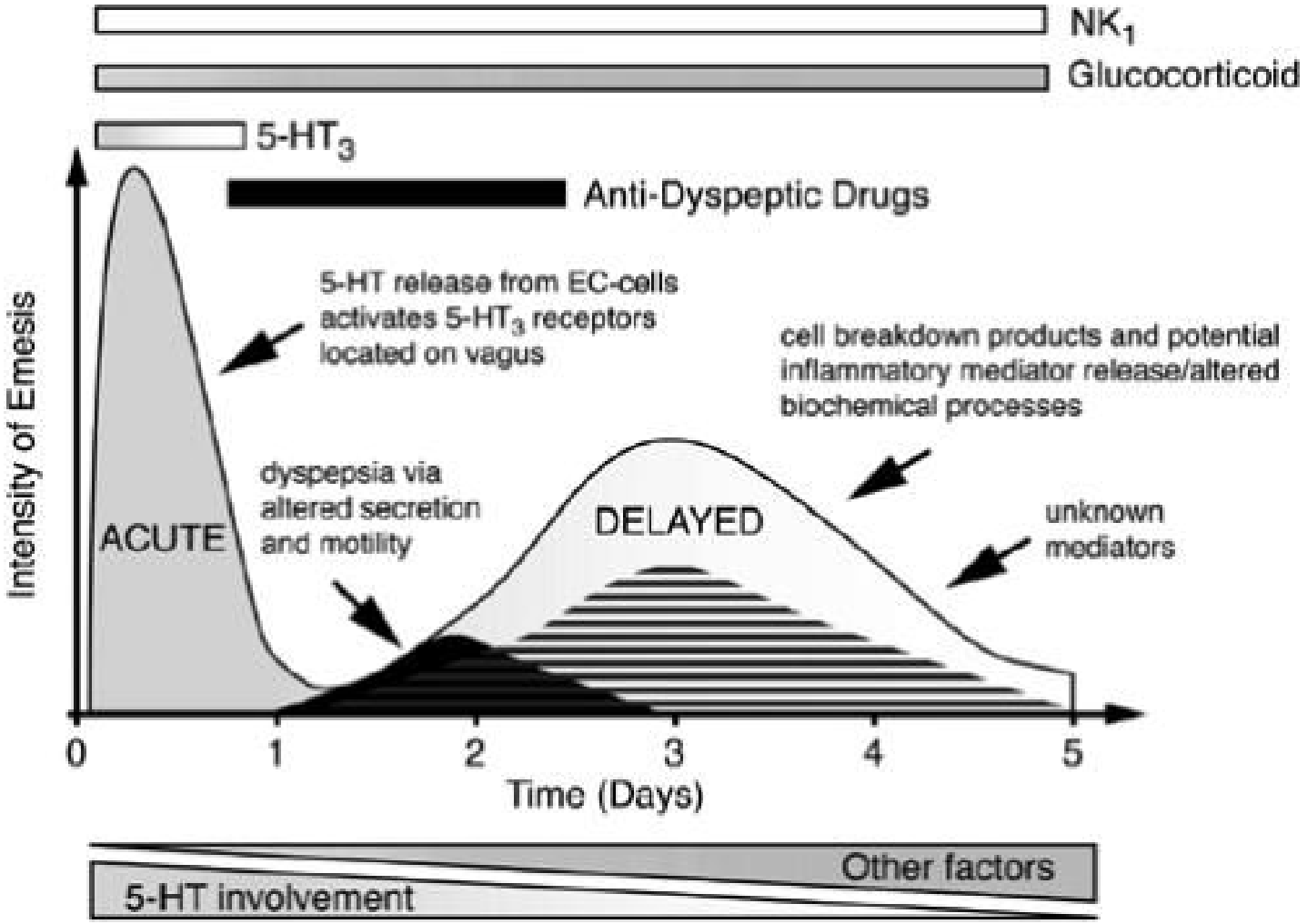


Source: L. L. Brunton, B. A. Chabner, B. C. Knollmann: Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 12ed.
www.accesspharmacy.com

CINV – clinical classification

- Early (acute) <24h since ChT
- Delayed > 24h since ChT
- Anticipational – before ChT administration
- Breakthrough – despite optimal prophylaxis
- Persistent – despite optimal prophylaxis and additional drugs

CINV – types and pathomechanism



CINV – patient related risk factors

- female sex
- young age
- no alcohol use
- history of kinetosis (motion sickness)
- CINV experienced previously
- history of gestational nausea and vomiting

CINV – emetogenic potential

High (>90%)

- Cisplatin
- Mechlorethamine
- Streptozotocine
- Cyclofosfamide ≥1500 mg/m2
- Carmustyna
- Dacarbazyna

- (cyklofosfamid+antracyklina)

Medium (30%–90%)

- Oxaliplatin
- Cytarabine >1 gm/m2
- Carboplatin
- Ifosfamide
- Cyclofosfamide <1500 mg/m2
- Doxorubicine
- Daunorubicine
- Epirubicine
- Idarubicine
- Irinotecan
- Azacytydine
- Bendamusine
- Clofarabine
- Alemtuzumab

Low (10%–30%)

- Paklitaxel
- Docetaxel
- Mitoxantron
- Liposomal doxorubicyna
- Ixabepilone
- Topotecan
- Etoposide
- Pemetrexed
- Metothrexat
- Mitomycine
- Gemcytabine
- Cytarabine ≤1000 mg/m2
- 5-FU
- Temsirolimus
- Bortezomib
- Cetuximab
- Trastuzumab
- Panitumumab

Minimal (<10%)

- Bleomycine
- Busulfan
- Fludarabine
- Winblastine
- Wincristine
- Winorelbine
- Bewacizumab

Available antiemetics – mechanism of action

	rec. D2	rec. M	rec. H	Rec. 5-HT3
scopolamine	+	++++	+	-
cyclisine	+	++	+++	-
dimenhydrinat	+	++	++++	-
hydroxizine	+	++	+++	-
setrons	-	-	-	++++
domperidon	++++	-	-	+
metoclopramide	+++	-	-	++
haloperidol	++++	-	+	-
droperidol	++++	-	+	+
chlopromazine	++++	++	++++	++
prochlorperazine	++++	++	++	+
olaznzapine	+	+	+	+++
steroids	-	-	-	-
NK-1 inhibitors	-	-	-	-
cannabinoids	-	-	-	-

CINV management

Optimal prophylaxis since the first dose

CINV management

5-HT_3 Antagonist	Half-Life (h)	Binding Affinity (pKi)*†
Palonosetron	40.0[1]	10.45[5]
Ondansetron	4.0[2]	8.39[5]
Dolasetron	7.3[3]	7.60[6]
Granisetron	9.0[4]	8.91[5]
Tropisetron	8.0[5]	8.7[5]

CINV – risk dependent prophylaxis

Guideline update for MASCC and ESMO in the prevention of chemotherapy- and radiotherapy-induced nausea and vomiting: results of the Perugia consensus conference

Table 5.
Chemotherapy-induced emesis: emetic risk levels and new MASCC and ESMO guidelines

Risk level	Chemotherapy	Antiemetic guidelines	MASCC Level of Scientific Confidence/Level of Consensus	ESMO Level of Evidence/Grade of Recommendation
High (>90%)	Cisplatin and other HEC (see Tables 1 and 2)	Day 1: 5-HT_3 receptor antagonist + DEX + (fos)aprepitant	High/high	I/A
		Days 2–3: DEX + aprepitant	High/Moderate	II/A
		Day 4: DEX	High/Moderate	
Moderate (30%–90%)	AC	Day 1: 5-HT_3 receptor antagonist + DEX + (fos)aprepitant[a]	High/High	I/A
		Days 2–3: aprepitant	Moderate/Moderate	II/B
	Non-AC MEC (see Tables 1 and 2)	Day 1: Palonosetron + DEX	Moderate/Moderate	II/B
		Days 2–3: DEX days 2–3	Moderate/Moderate	II/B
Low (10%–30%)	See Tables 1 and 2	Day 1: DEX or 5-HT_3 or dopamine receptor antagonist	No confidence possible/Moderate	III, IV/D
		Days 2–3: no routine prophylaxis		
Minimal (<10%)	See Tables 1 and 2	Day 1: no routine prophylaxis	No confidence possible/high	V/D
		Days 2–3: no routine prophylaxis		

DEX, dexamethasone; AC, combination of an anthracycline (doxorubicin or epirubicin) and cyclophosphamide.

[a] (fos)aprepitant: either i.v. or oral form of the NK1 receptor antagonist.

For doses of day 1 see Tables 3 and 4. The dose of aprepitant for days 2 and 3 is 80 mg. The optimal duration and dose of dexamethasone in the delayed phase has not been defined.

If the NK_1 receptor antagonist is not available for AC chemotherapy, palonosetron is the preferred 5-HT_3 receptor antagonist.

CINV – management

Breakthrough and persistent CINV

- optimal prophylaxis (always reassess)
- utilize a drug with different mode of action (ie metoclopramide 10 mgwhen setron in prophylaxis)
- utilize pleiotropic drug (ie 5mg olanzapine or 50mg dimenhydrinate)
- synergistic effect of steroids

Radiation-induced nausea and vomiting

High risk (>90%)

- whole body
- lymphatic system

Medium risk (60-90%)

- upper abdomen
- hemibody

Low risk (30-60%)

- brain
- spinal cord
- head and neck
- chest
- pelvis

Minimal (<30%)

- breast
- extremities

RINV – risk dependent prophylaxis

Guideline update for MASCC and ESMO in the prevention of chemotherapy- and radiotherapy-induced nausea and vomiting: results of the Perugia consensus conference

Table 6.
Radiotherapy-induced emesis: emetic risk levels and new MASCC and ESMO guidelines[a]

Risk level	Irradiated area	Antiemetic guidelines	MASCC Level of Scientific Confidence/Consensus	ESMO Level of Evidence/Grade of Recommendation
High (>90%)	Total body irradiation, total nodal irradiation	Prophylaxis with 5-HT_3 receptor antagonists + DEX	High/High (for the addition of DEX: Moderate/High)	II/B (for the addition of DEX: III/C)
Moderate (60–90%)	Upper abdomen, HBI, UBI	Prophylaxis with 5-HT_3 receptor antagonists + optional DEX	High/High (for the addition of DEX: Moderate/High)	II/A (for the addition of DEX: II/B)
Low (30%–60%)	Cranium, craniospinal, H&N, lower thorax region, pelvis	Prophylaxis or rescue with 5-HT_3 receptor antagonists.	Moderate/High (for rescue: Low/High	III/B for rescue: IV/C
Minimal (<30%)	Extremities, breast	Rescue with dopamine receptor antagonists or 5-HT_3 receptor antagonists	Low/High	IV/D

HBI, half body irradiation; UBI, upper body irradiation; H&N, head and neck; DEX, dexamethasone.

[a] In concomitant radiochemoterapy the antiemetic prophylaxis is according to the chemotherapy-related antiemetic guidelines of the corresponding risk category, unless the risk of emesis is higher with radiotherapy than chemotherapy.

CINV – practical approach

Prophylaxis

- Minimal risk – no prophylaxis
- Low risk – setron only (short acting)
- Medium risk – setron (pref. long acting) +steroid
- High risk - setron (pref. long acting) + steroid + antyNK1

- Assess additional risk factors

CINV – practical approach

Night shift – vomiting cancer patient

- Check for underlying causes (ileus, hyperglicemia, hypercalcemia, infection)
- If none
  - Ondansetron 8mg +/- dexamethasone 8mg
  - Metolcopramide 10mg or olanzapine 5 mg – if already received setrons

Questions

Cancer related pain

Cancer pain - overview

- Related to tumor involvement
  - Accounts for 78% of pain problems in inpatient cancer population and 62% of outpatient cancer population
  - most common causes:
    - Metastatic bone disease
    - hollow organs involvement
    - nerve compression or infiltration
- Pain associated with cancer therapy
  - 19% of pain problems in inpatient population and 25% in outpatient population
- Pain unrelated to cancer or therapy
  - Approximately 3% of inpatients have pain unrelated to their cancer and 10% in outpatient population
- Generalized pain in a dying cancer patient

Cancer pain

Criteria for cancer pain classification

- Temporal
  - Acute/chronic
  - Descriptive of different time patterns
- Etiological
  - Due to cancer
  - Due to cancer treatments
  - Due to other causes
- According to initiating tissue damage
  - Bone
  - Soft tissue
  - Neurological
  - Muscle spasm
- Pathophysiological
  - Nociceptive somatic
  - Nociceptive visceral
  - Neuropathic
  - Idiopathic
- Pain syndrome
  - Check-list of clinical-anatomical entities
- Associated clinical features
  - Continuous
  - Superficial
  - Radiating etc

Cancer pain – assessment

Validated assessment tools for the assessment of pain

Visual analogue scale

10 cm

no pain ——————————— worst pain

Verbal rating scale

- No pain 1
- Very mild 2
- Mild 3
- Moderate 4
- Severe 5
- Very severe 6

Numerical rating scale

no pain 0 1 2 3 4 5 6 7 8 9 10 worst pain

Cancer pain - assessment

1. Assess and re-assess the pain

- causes, onset, type, site, absence/presence of radiating pain, duration, intensity, relief and temporal patterns of the pain, number of breakthrough pains, pain syndrome, inferred pathophysiology, pain at rest and/or moving
- presence of the trigger factors and the signs and symptoms associated with the pain
- presence of the relieving factors
- use of analgesics and their efficacy and tolerability
- require the description of the pain quality

  *aching, throbbing, pressure: often associated with somatic pain in skin, muscle and bone

  *aching, cramping, gnawing, sharp: often associated with visceral pain in organs or viscera

  *shooting, sharp, stabbing, tingling, ringing: often associated with neuropathic pain caused by nerve damage

2. Assess and re-assess the patient

- clinical situation by means of a complete/specific physical examination and the specific radiological and/or biochemical investigations
- presence of interference of pain with the patient's daily activities, work, social life, sleep patterns, appetite, sexual functioning, mood, well-being, coping
- impact of the pain, the disease and the therapy on the physical, psychological and social conditions
- presence of a caregiver, the psychological status, the degree of awareness of the disease, anxiety and depression and suicidal ideation, his/her social environment, quality of life, spiritual concerns/needs, problems in communication, personality disorders
- presence and intensity of signs, physical and/or emotional symptoms associated with cancer pain syndromes
- presence of comorbidities (i.e. diabetic, renal and/or hepatic failure etc.)
- functional status
- presence of opioidophobia or misconception related to pain treatment
- alcohol and/or substance abuse

- 3. Assess and re-assess your ability to inform and to communicate with the patient and the family
  - Take time to spend with the patient and the family to understand their needs

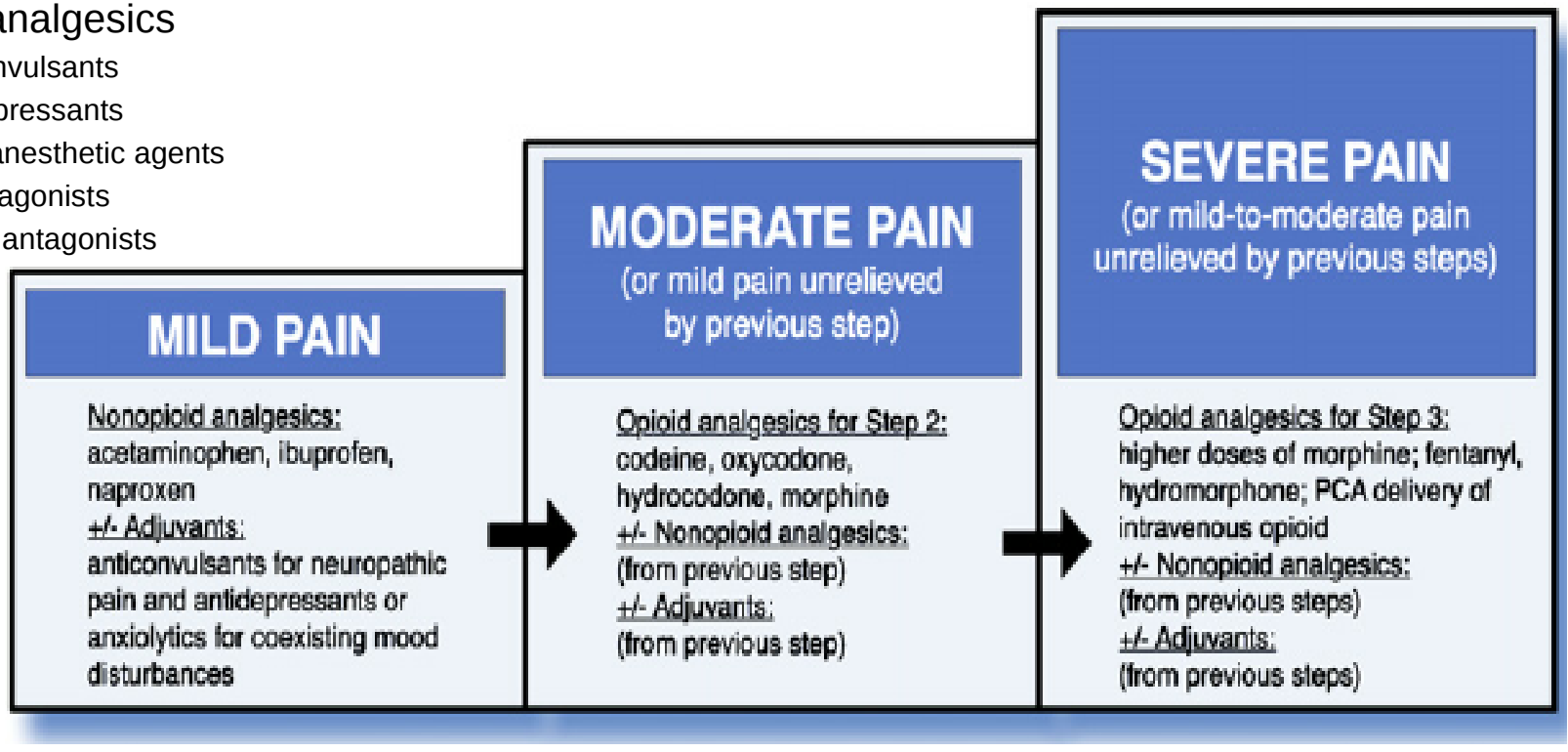
Cancer pain - therapy

Pharmacotherapy

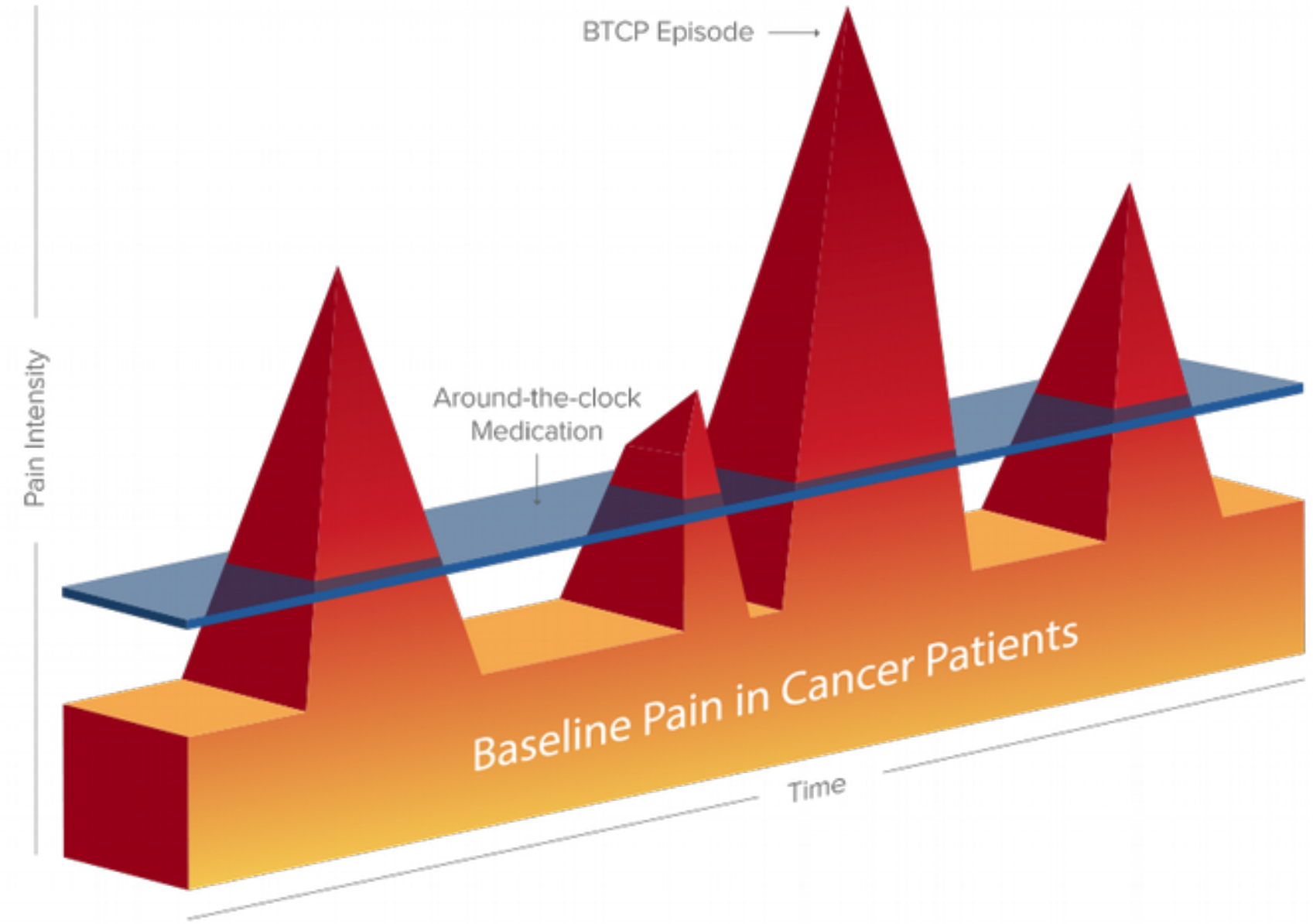
- Non-opioid analgesics
  - NSAIDs
  - Acetaminophen
- Opioid analgesics
  - Codeine
  - Morphine
  - Oxycodone
  - Fentanyl
  - Hydromorphone
  - Methadone
- Adjuvant analgesics
  - Anticonvulsants
  - Antidepressants
  - Local anesthetic agents
  - GABA agonists
  - NMDA antagonists
  - Others

Non-pharmacological Modalities

- Cognitive behavioral interventions
- Massage, Physical Therapy
- Acupuncture
- Radiation Therapy
- Surgery
- Interventional procedures



Cancer pain – breakthrough pain



Cancer pain

Opioids	Age	Sex	Ethnicity	Hepatic impairment[24]	Renal impairment[24]	Cardiovascular/ respiratory disease	Risk of abuse
Morphine	Clearance may be reduced in older patients	No effect	Chinese patients have higher clearance	Dose adjustments recommended	Dose adjustments recommended	Use with caution	Frequently abused
Hydrocodone	Caution recommended in older patients	No effect	No effect	May be formulated in combination with acetaminophen; liver function testing advised in patients with hepatic impairment	May be formulated in combination with acetylsalicylic acid; renal function testing advised in patients with renal impairment	Use with caution	Frequently abused
Oxycodone	Concentrations nominally higher in older patients	Concentrations ≈ 25% higher in women than in men	No effect	Dose adjustments recommended	Dose adjustments recommended	More respiratory depression than morphine or tramadol	TRF available
Buprenorphine	No dose adjustment necessary	No effect	No effect	Not evaluated	No effect	Use with caution	Recommended for patients with confirmed or suspected misuse/with daily supervised dispensing
Hydromorphone	No effect	C_{max} 25% higher in men; AUC_{0-24} is the same in both sexes	No effect	Dose adjustments recommended	Dose adjustments recommended	Use with caution	Frequently abused
Oxymorphone	Steady-state concentrations ~40% higher in older patients	Concentrations the same in men and women after adjusting for body weight	No effect	Contraindicated in patients with moderate to severe hepatic impairment	Dose adjustments recommended	Use with caution	TRF available
Levorphanol	Dose adjustments may be required for older patients	No effect	No effect	Not evaluated	Not evaluated	Dose adjustments recommended	Frequently abused
Tapentadol	Dose adjustments recommended	No effect	No effect	Contraindicated in patients with severe hepatic impairment	Contraindicated in patients with severe renal impairment	Use with caution	TRF available
Fentanyl	Clearance may be reduced in older patients	No effect	No effect	Dose adjustment may not be necessary	Dose adjustment may not be necessary	Use with caution	Frequently abused
Methadone	Dose adjustments may be required for older patients	No effect	No effect	Dose adjustments recommended in patients with severe hepatic impairment	Dose adjustments recommended in patients with severe renal impairment	Avoid	Recommended for patients with confirmed or suspected misuse/with daily supervised dispensing

Cancer pain

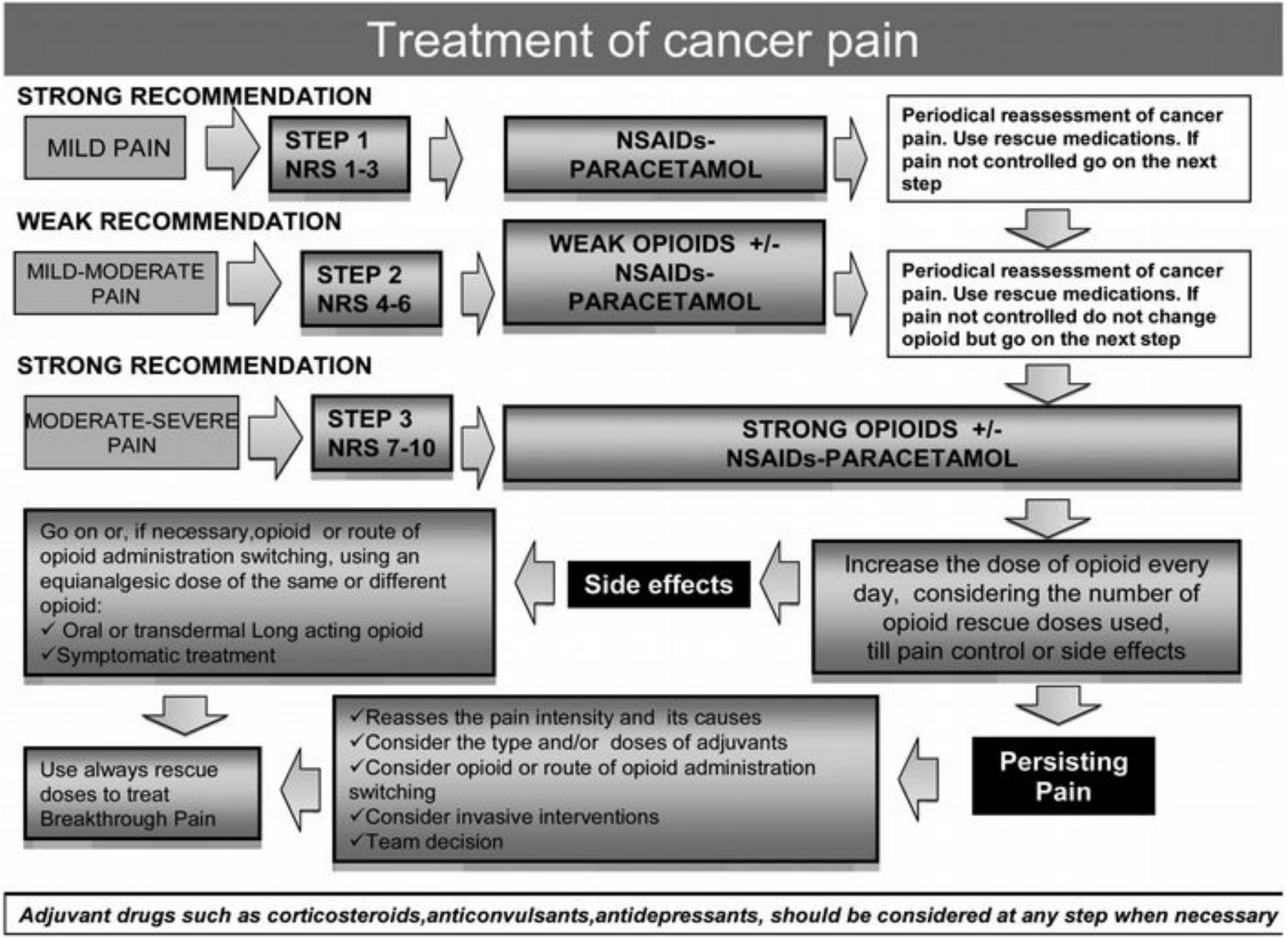
There are differences in the literature regarding opioid conversion ratios. The conversion ratios listed below are the conversion ratios commonly used in practice at Our Lady's Hospice and Care Services (OLH&CS). The information outlined below is intended as a guide only. All medication doses derived using the information below should be checked and prescribed by an experienced practitioner. The dosage of a new opioid is based on several factors including the available equi-analgesic dose data, the clinical condition of the patient, concurrent medications and patient safety. It is recommended that the new dose should be reduced by 30-50% to allow for incomplete cross-tolerance. The patient should be monitored closely until stable when switching opioid medications.

GOLDEN RULE: WHEN CHANGING FROM ONE OPIOID TO ANOTHER ALWAYS CONVERT TO MORPHINE FIRST.

ORAL MORPHINE TO ORAL OPIOIDS		ORAL OPIOIDS TO PARENTERAL OPIOIDS		PARENTERAL MORPHINE TO OTHER OPIOIDS		TRANSDERMAL OPIOID TO ORAL MORPHINE	
PO → PO	RATIO	PO → IV/SC	RATIO	IV/SC → IV/SC	RATIO	TD → PO	RATIO
Morphine → Oxycodone	1.5:1	Morphine → Morphine	2:1	Morphine → Oxycodone	1.5:1	Buprenorphine → Morphine	1:75
Morphine → Hydromorphone	5:1	Oxycodone → Oxycodone	2:1	Morphine → Hydromorphone	5:1	Fentanyl → Morphine	1:100
		Hydromorphone → Hydromorphone	2:1	Morphine → Alfentanil	15:1		

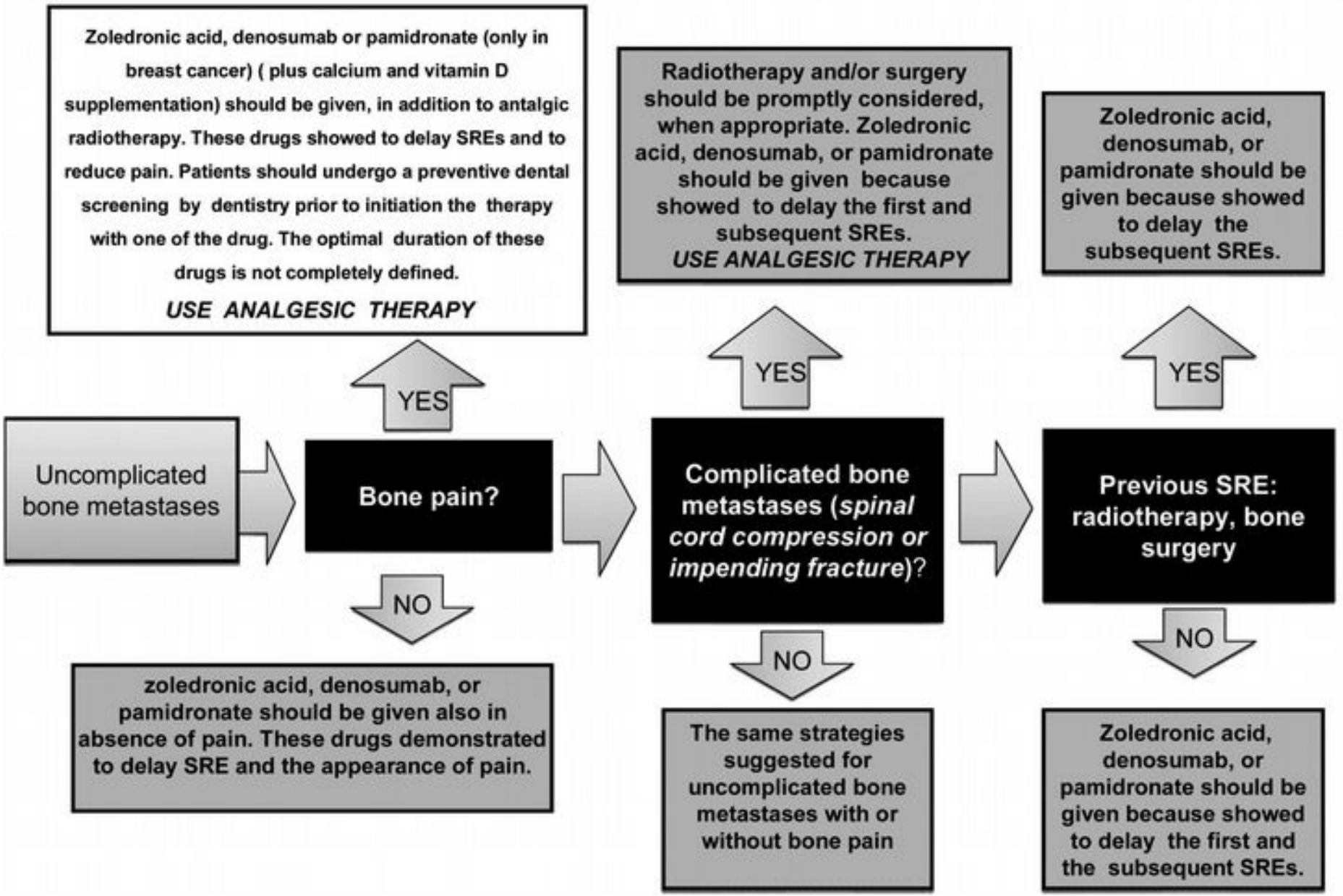
(Note: This table does not incorporate recommended dose reductions of 30-50%.)

MORPHINE 24 hour dose		OXYCODONE 24 hour dose		HYDROMORPHONE 24 hour dose		FENTANYL	ALFENTANIL 24 hour dose	BUPRENORPHINE
ORAL	IV/SC	ORAL	IV/SC	ORAL	IV/SC	TRANSDERMAL*	IV/SC	TRANSDERMAL*
5mg	2.5mg	3.33mg	1.66mg	1mg	0.5mg	-	0.16mg	-
10mg	5mg	6.66mg	3.33mg	2mg	1mg	-	0.33mg	5 micrograms/hour*
14.4mg	7.2mg	9.6mg	4.8mg	2.88mg	1.44mg	6 micrograms/hour	0.48mg	-
20mg	10mg	13.33mg	6.66mg	4mg	2mg	-	0.66mg	10 micrograms/hour*
28.8mg	14.4mg	19.2mg	9.6mg	5.76mg	2.88mg	12 micrograms/hour	0.96mg	-
30mg	15mg	20mg	10mg	6mg	3mg	-	1mg	15 micrograms/hour*
50mg	25mg	33.33mg	16.66mg	10mg	5mg	-	1.6mg	25 micrograms/hour*
60mg	30mg	40mg	20mg	12mg	6mg	25 micrograms/hour	2mg	35 micrograms/hour*
100mg	50mg	66.66mg	33.33mg	20mg	10mg	-	3.3mg	52.5micrograms/hour*
120mg	60mg	80mg	40mg	24mg	12mg	50 micrograms/hour	4mg	70 micrograms/hour*
150mg	75mg	100mg	50mg	30mg	15mg	-	5mg	
180mg	90mg	120mg	60mg	36mg	18mg	75 micrograms/hour	6mg	
200mg	100mg	133.33mg	66.66mg	40mg	20mg	-	6.66mg	
240mg	120mg	160mg	80mg	48mg	24mg	100 micrograms/hour	8mg	



C. I. Ripamonti et al. Ann Oncol 2012;23:vii139-vii154

Treatment of pain due to bone metastases



C. I. Ripamonti et al. Ann Oncol 2012;23:vii139-vii154

Cancer pain - practice

Managing patient with acute, uncontrolled pain: morphine iv. titration

- Needed:
  - syringe pump
  - 1:1 solution (ie 20mg morphine in 20 ml 0,9% NaCl)
  - naloxone
  - a watch or any other timepiece

Cancer pain - practice

Managing patient with acute, uncontrolled pain: morphine iv. titration

- Procedure:
  - set pump for slow infusion (ie. 0,1 mg/h)
  - administer bolus doses of 1mg every 1-2 minutes until the pain become acceptable.
  - set infusion rate for [number of boluses needed]/8 mg/h (ie. If 6 boluses of 1mg were required then 6/8 = 0,75mg/h).
-

Cancer pain - practice

Managing patient with acute, uncontrolled pain: morphine iv. titration

- Aftermath
  - assess the pain control periodically
  - administer rescue doses (boluses) for brakthrough pain
  - If >4 rescue doses/day or any other form of significant pain control deterioratio – increse flow by 20%.

Questions

UNIWERSYTET JAGIELLOŃSKI
COLLEGIUM MEDICUM

Thank You

Paweł Potocki, MD

Jagiellonian University Medical College
Kraków University Hospital
Departament of Clinical Oncology

pawel.potocki@uj.edu.pl