

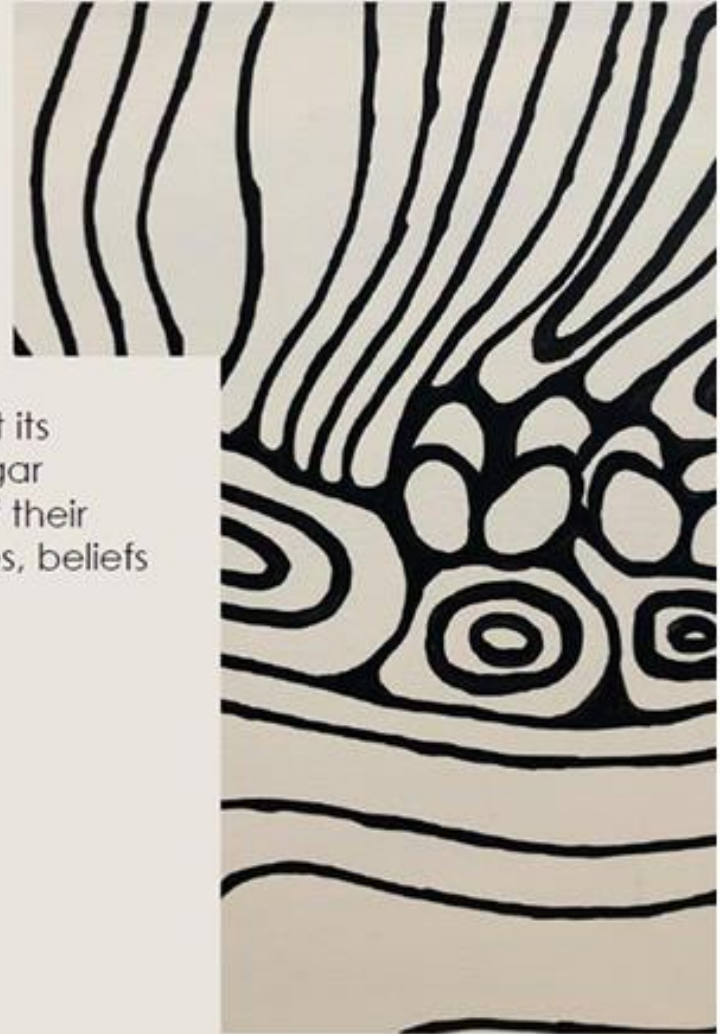
# DENT 3005: Introduction to Pharmacology

## **Psychotropic drugs**

Dr Thuy Linh Truong  
[thuy.truong@uwa.edu.au](mailto:thuy.truong@uwa.edu.au)

# Acknowledgement of country

The University of Western Australia acknowledges that its campus is situated on Noongar land, and that Noongar people remain the spiritual and cultural custodians of their land, and continue to practise their values, languages, beliefs and knowledge.



# Learning Outcomes

## Learning objectives

- 1) Understand the different types of psychotropic drugs and their mechanism of actions
- 2) Recognise oral and dental side effects of these drugs
- 3) Understand drugs interactions with dental medications
- 4) Applied knowledge to clinical scenarios



# Psychotropic drugs

- Major depression
- Anxiety & related disorders
- Eating disorders
- Bipolar disorder
- Insomnia
- ADHD
- Alcohol withdrawal
- Long term treatment for alcohol dependence
- Nicotine dependence
- Opioid dependence

# Antidepressants

- **Major depression**
  - Relieve psychological and physical symptoms
  - Improve functional capacity
  - Reduce the likelihood of self-harm or suicide
- **Anxiety and related disorders**
  - Control symptoms and improve social functioning
- **Eating disorders**
  - A multidisciplinary approach
  - Psychological treatments [cognitive behaviour therapy, interpersonal psychotherapy, family psychotherapy]
  - SSRIs: bulimia nervosa, binge eating disorder

## **Antidepressants: adverse effects**

- **Serotonin toxicity**
  - Tramadol
- **Withdrawal effects**
  - Nausea, vomiting, anxiety, agitation, tremor and many more

# MOA inhibitors

- **MOA:** Nonselective MAOIs irreversibly inhibit monoamine oxidases A and B
- **Drug interactions**
  - Serotonin toxicity: tramadol (CI)
  - Adrenaline: may increase effect of adrenaline (caution)
  - Tapentadol: increase risks for HTN (CI)
- **ADR [common]**
  - Orthostatic hypotension, headache, drowsiness, fatigue, weakness, agitation, tremors, twitching, myoclonus, hyperreflexia, dizziness, dry mouth

(CI) = Contraindicated

Generic name	Brand Name
Phenelzine	Only through SAS
Tranlycypromine	Parnate

*Myoclonus: sudden, brief, involuntary muscle jerks or twitches, often described as shock-like movements, that can affect a single muscle or a group of muscles.*

# SSRIs

- **MOA:** SSRIs selectively inhibit the presynaptic reuptake of serotonin
- **Drug interactions**
  - Serotonin toxicity: tramadol
  - Citalopram, escitalopram, fluoxetine + QT prolongation
  - Fluoxetine, fluvoxamine + CYP3A4 inH
- **ADR [common]**
  - Agitation, drowsiness, tremor, dry mouth, dizziness, headache, sweating, weakness, anxiety

Generic name	Brand Name
Citalopram	Celapram
Escitalopram	Lexapro
Fluoxetine	Zactin
Fluvoxamine	Luvox
Paroxetine	Paxtine
Sertraline	Setrona

# Tricyclic antidepressants

- **MOA:** inhibit reuptake of noradrenaline and serotonin into presynaptic terminals
- **Drug interactions**
  - QT prolongation drugs
  - CNS depressant drugs
  - Adrenaline: added sympathomimetic effects (caution)
  - Clomipramine, imipramine: serotonin toxicity
- **ADR [common]**
  - Sedation, dry mouth, orthostatic hypotension, tremor, dizziness, sweating, agitation, anxiety, confusion

Generic name	Brand Name
Amitriptyline	Endep
Clomipramine	Anafranil
Dothiepin	Dothep
Doxepin	Deptran
Imipramine	Tofranil
Nortriptyline	Allegron

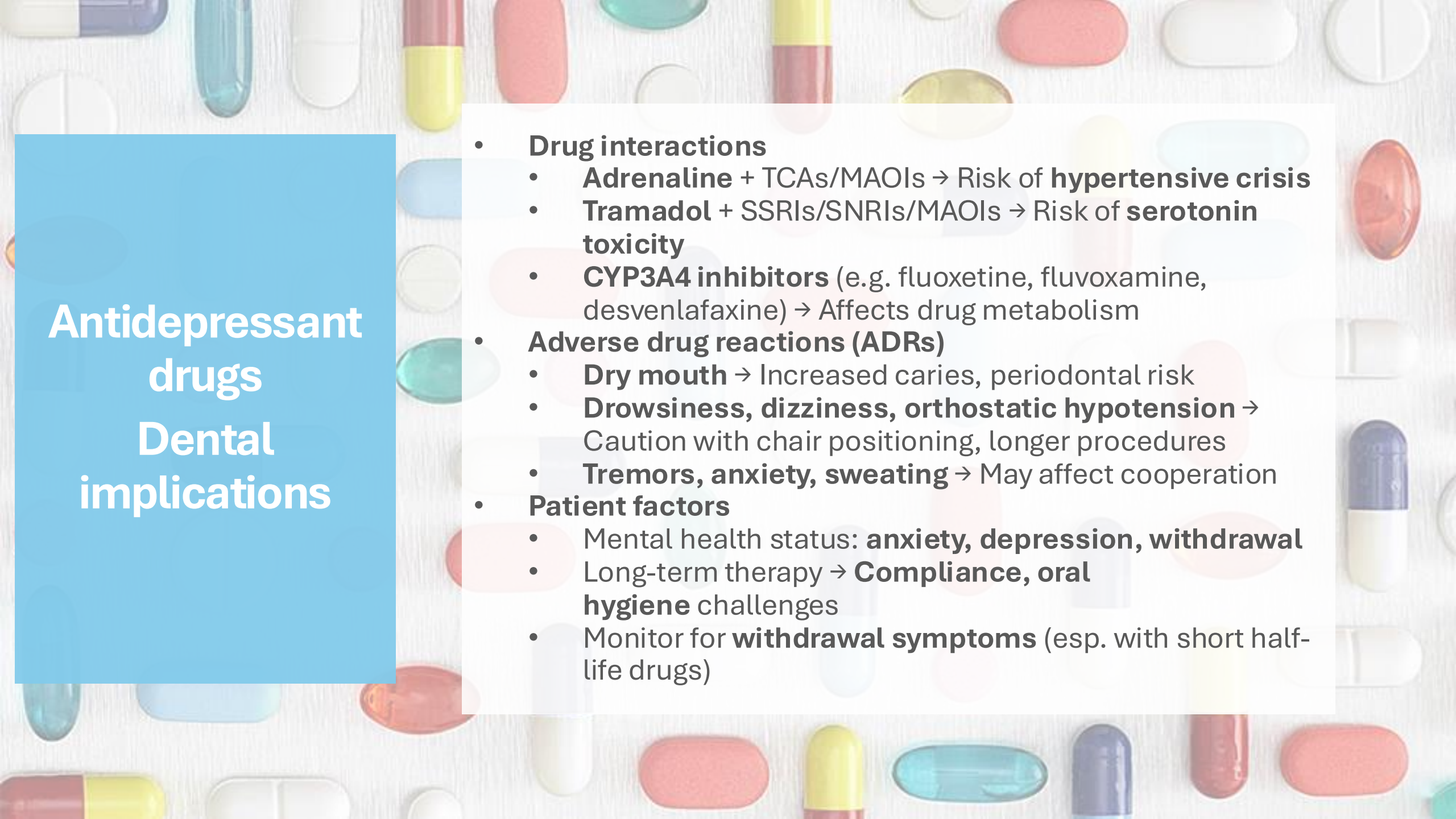
## SNRIs

- **MOA:** inH serotonin and noradrenalin reuptake
- **Drug interactions**
  - Serotonin toxicity
  - Desvenlafaxine + CYP3A4 inH
- **ADR**
  - **[common]:** dry mouth, yawning, sweating, dizziness, headache, tremor
  - **[infrequent]:** orthostatic hypotension and fainting

Generic name	Brand Name
Desvenlafaxine	Pristiq
Duloxetine	Tixol
Venlafaxine	Efexor

## Other antidepressants

Generic name (Brand)	Selected drug interaction	Selected ADR
Agomelatine (Valdoxan)	Nil dental	<b>Infrequent (0.1–1%):</b> Anxiety, fatigue, excessive sweating, itch
Mianserin (Lumin)	Nil dental	<b>Common (&gt;1%):</b> Sedation, dry mouth, dizziness, vertigo
Mirtazepine (Axit)	Maybe contribute to serotonin toxicity???	<b>Common (&gt;1%):</b> Sedation, weakness <b>Rare (&lt;0.1%):</b> Orthostatic hypotension, seizures
Moclobemide (Amira)	Serotonin toxicity (tramadol)	<b>Common (&gt;1%):</b> Dry mouth, anxiety, dizziness, headache
Reboxetine (Edronax)	CYP3A4 inH	<b>Common (&gt;1%):</b> Dry mouth, sweating, orthostatic hypotension, headache, paraesthesia, dizziness
Vortioxetine (Brintellix)	Maybe contribute to serotonin toxicity???	<b>Common (&gt;1%):</b> Dry mouth, itch



## Antidepressant drugs Dental implications

- **Drug interactions**
  - **Adrenaline** + TCAs/MAOIs → Risk of **hypertensive crisis**
  - **Tramadol** + SSRIs/SNRIs/MAOIs → Risk of **serotonin toxicity**
  - **CYP3A4 inhibitors** (e.g. fluoxetine, fluvoxamine, desvenlafaxine) → Affects drug metabolism
- **Adverse drug reactions (ADRs)**
  - **Dry mouth** → Increased caries, periodontal risk
  - **Drowsiness, dizziness, orthostatic hypotension** → Caution with chair positioning, longer procedures
  - **Tremors, anxiety, sweating** → May affect cooperation
- **Patient factors**
  - Mental health status: **anxiety, depression, withdrawal**
  - Long-term therapy → **Compliance, oral hygiene** challenges
  - Monitor for **withdrawal symptoms** (esp. with short half-life drugs)

# Antipsychotics

- **Indication:** acute & chronic psychosis, bipolar disorder
- **MOA:** blockade of dopaminergic transmission?
- **Drug interactions**
  - **CNS depressants:** check individual monograph
  - **QT prolongation:** Amisulpride, droperidol, haloperidol, ziprasidone
  - **CYP3A4 inH:** Aripiprazole, brexpiprazole, cariprazine, haloperidol, lurasidone, quetiapine, ziprasidone
- **ADR [common]:** sedation, anxiety, agitation, EPSE, orthostatic hypotension, dry mouth
  - EPSE: dystonia, akathisia, parkinsonism, tardive dyskinesia

## Antipsychotics

Amisulpride

Aripiprazole

Asenapine

Brexpiprazole

Cariprazine

Chlorpromazine

Clozapine

Droperidol

Flupentixol

Haloperidol

Lurasidone

Olanzapine

Paliperidone

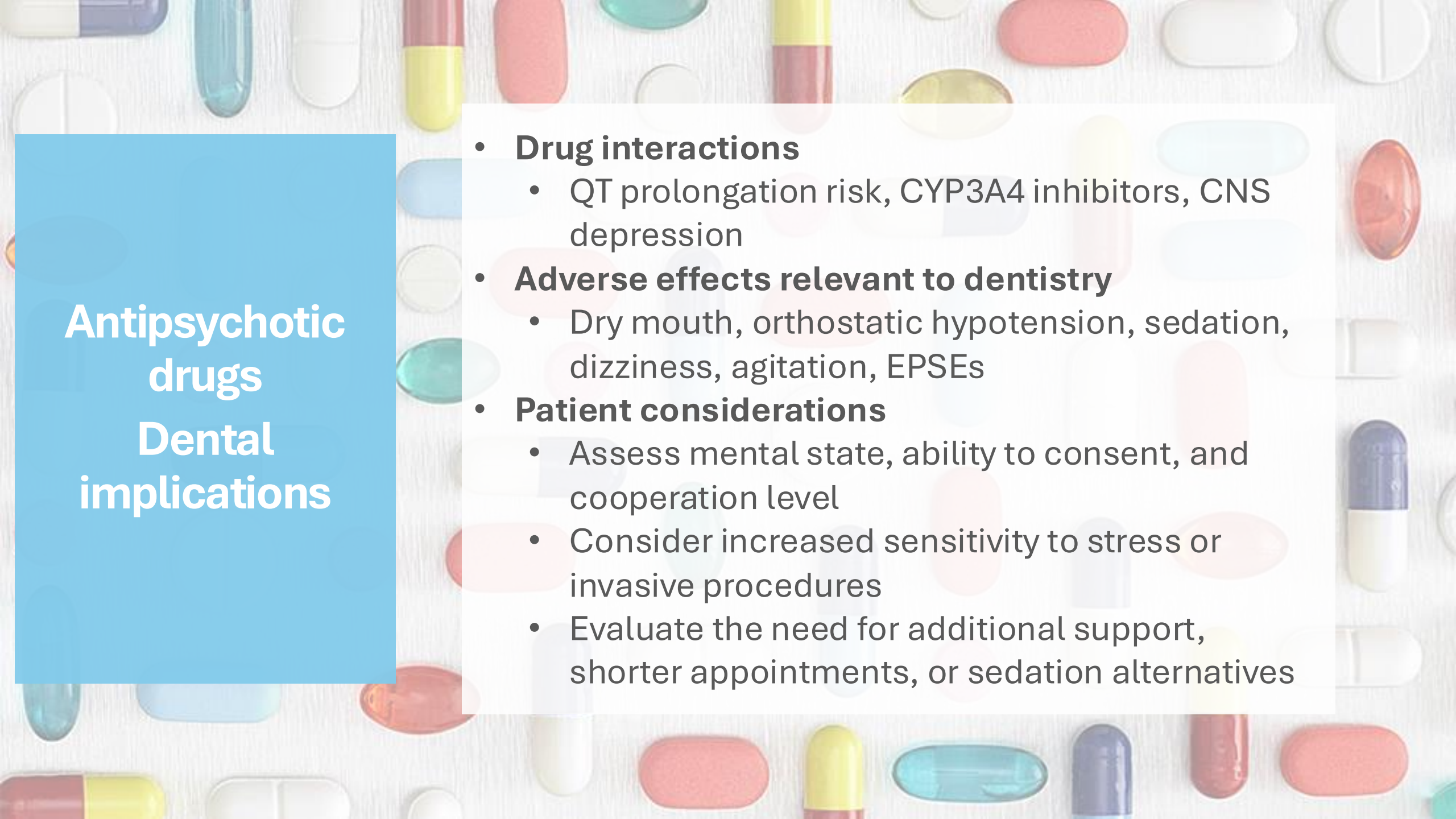
Periciazine

Quetiapine

Risperidone

Ziprasidone

Zuclopenthixol



## Antipsychotic drugs Dental implications

- **Drug interactions**
  - QT prolongation risk, CYP3A4 inhibitors, CNS depression
- **Adverse effects relevant to dentistry**
  - Dry mouth, orthostatic hypotension, sedation, dizziness, agitation, EPSEs
- **Patient considerations**
  - Assess mental state, ability to consent, and cooperation level
  - Consider increased sensitivity to stress or invasive procedures
  - Evaluate the need for additional support, shorter appointments, or sedation alternatives

# Drugs for bipolar disorder

- **Pharmacological**
  - **Antipsychotics, antiepileptics (carbamazepine, lamotrigine, valproate)** – *mentioned in antiepileptic lectures*
  - **Lithium** (*Lithicarb, Quilonum SR*)
- **Lithium: [MOA]** unknown? Inh dopamine release? Enhance serotonin release?
  - **Drug interactions**
    - **Serotonin toxicity:** tramadol
    - **NSAIDs:** reduce renal lithium excretion
  - **ADR [common]:** metallic taste, fatigue, headache, vertigo, tremor, acne, psoriasis



## Drugs for bipolar disorder

### Dental implications

- **Lithium interactions**
  - Avoid NSAIDs (except low-dose aspirin) → risk of lithium toxicity
  - Monitor for signs of toxicity if analgesics are prescribed
- **Serotonin toxicity risk:** caution with tramadol
- **Common side effects relevant to dentistry**
  - Metallic taste → altered taste perception
  - Tremor, fatigue → difficulty with fine motor control, cooperation during procedures
  - Dry skin or acne → consider skin sensitivity around oral cavity
- **Communication and care**
  - Assess for sedation, mental alertness, and ability to consent
  - Schedule shorter or more frequent appointments if needed

# Drugs for anxiety & sleep disorders

- **Non-pharmacological**

- CBT first line: insomnia & anxiety
- Remove source of sleep disturbance
- Sleep hygiene principles

- **Pharmacological**

- Benzodiazepines
- Non-amphetamine psychostimulants
- Orexin receptor antagonists
- Other: diphenhydramine, doxylamine, melatonin, zolpidem, zopiclone

# Benzodiazepines

- [psychotropics] – *also in neurology*
- **MOA:** potentiate inhibitory effect of GABA
- **Drug interactions**
  - Other CNS depressants: monitor sedation
  - Alprazolam: itraconazole, ketoconazole → enhance sedation & respiratory depression
  - Diazepam + fluconazole → increase adverse effect
  - Midazolam + [CYP3A4 inh] → enhance sedation & respiratory depression
- **ADR:** drowsiness, oversedation, lightheadedness, hypersalivation, ataxia

[Alprazolam](#)

[Bromazepam](#)

[Clobazam](#)

[Clonazepam](#)

[Diazepam](#)

[Flunitrazepam](#)

[Lorazepam](#), [Lorazepam \(neurology\)](#)

[Midazolam \(anaesthesia\)](#), [Midazolam \(neurology\)](#)

[Nitrazepam](#)

[Oxazepam](#)

[Temazepam](#)

*Ataxia refers to a loss of coordination and balance, resulting in clumsy or awkward movements, often affecting walking, speech, and fine motor skills.*

# Non-amphetamine psychostimulants

- **MOA:** unknown
- **Drug interactions**
  - CYP3A4 inH
- **ADR:** dry mouth, headache, anxiety, palpitations, nervousness, dizziness, hypertension

Generic name	Brand Name
Armodafinil	Nuvigil
Modafinil	Modafin

# Orexin receptor antagonists

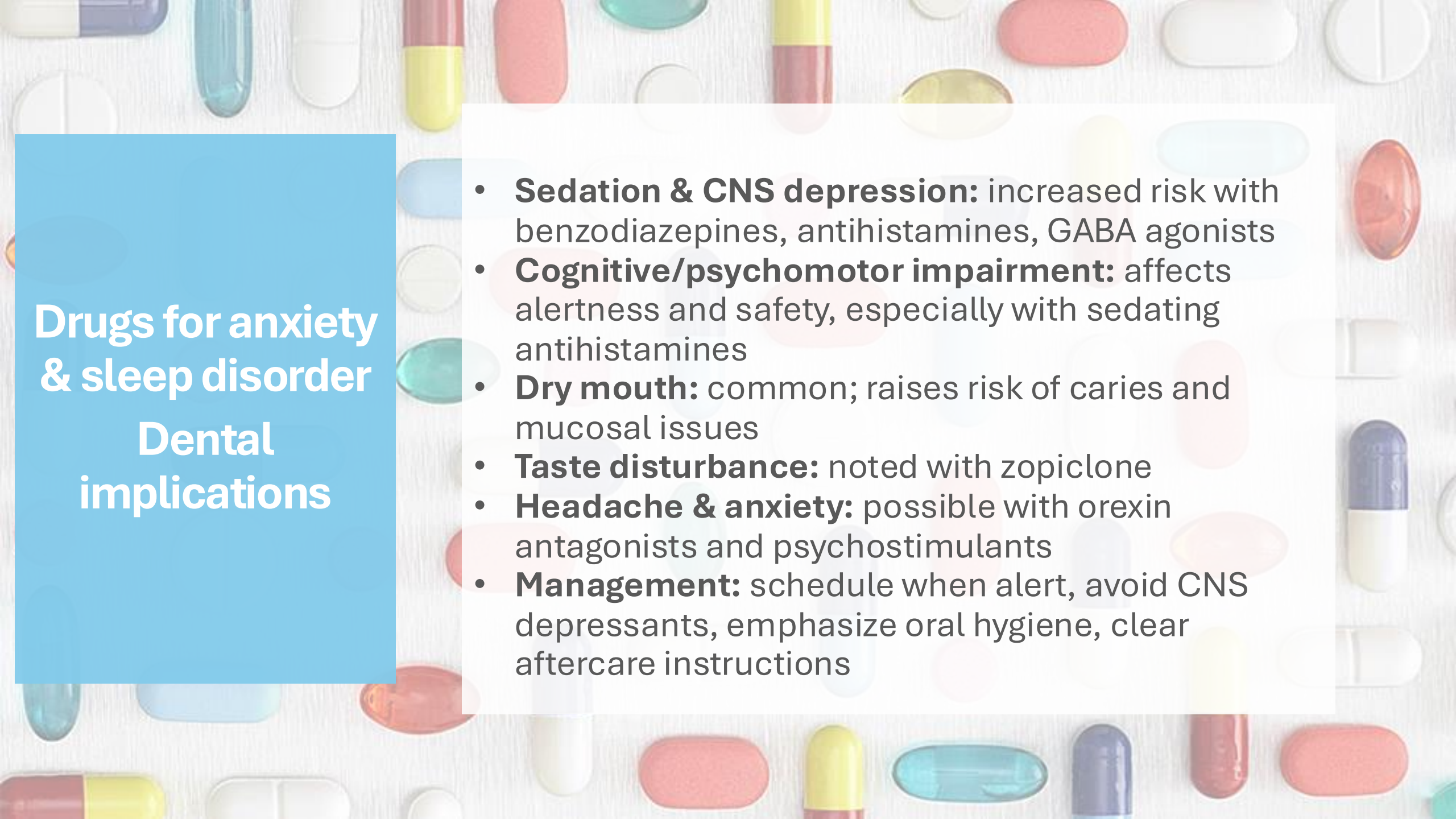
- **Indication:** chronic insomnia
- **MOA:** block the binding of wake-promoting orexin A and B neuropeptides
- **Drug interactions**
  - CYP3A4 inH
- **ADR:** headache

Generic name	Brand Name
Lemborexant	Dayvigo
Suvorexant	Belsomra

## Other

- **Drug interactions:** other CNS depressants
- **Sedating antihistamines:** diphenhydramine, doxylamine
  - **ADR:** sedation, psychomotor impairment, dizziness, confusion, headache, dry mouth
- **Melatonin:** control of circadian rhythms
  - **ADR:** nil dental
- **GABA agonists:** zolpidem, zopiclone
  - **[Zopiclone] ADR:** taste disturbance (bitter), dry mouth, drowsiness, impaired alertness the next morning

Generic name	Brand Name
Melatonin	Circadin
Zolpidem	Stilnox
Zopiclone	Imrest



## Drugs for anxiety & sleep disorder

### Dental implications

- **Sedation & CNS depression:** increased risk with benzodiazepines, antihistamines, GABA agonists
- **Cognitive/psychomotor impairment:** affects alertness and safety, especially with sedating antihistamines
- **Dry mouth:** common; raises risk of caries and mucosal issues
- **Taste disturbance:** noted with zopiclone
- **Headache & anxiety:** possible with orexin antagonists and psychostimulants
- **Management:** schedule when alert, avoid CNS depressants, emphasize oral hygiene, clear aftercare instructions

# Drugs attention deficit hyperactivity disorder

- **Chronic condition:** inattentive, hyperactive-impulsive, combination
- **Pharmacological**
  - Drug choice: psychostimulants
  - Other: Atomoxetine, guanfacine or clonidine
  - Lack of evidence
    - Dietary replacement
    - Supplementation of selected vitamins
    - Biofeedback
    - Perceptual stimulation

# Psychostimulants

- **MOA:** enhance dopaminergic and noradrenergic neurotransmission
- **Drug interactions:** Nil dental
- **ADR**
  - **[common]:** dry mouth, anxiety, irritability, headache, dizziness, aggression, palpitations
  - **[Infrequent]:** movement disorders, tics

Generic name	Brand Name
Dexamfetamine	Dexamfetamine
Lisdexamfetamine	Vyvanse
Methylphenidate	Concerta

## Other

- **Atomoxetine:** selectively inhibits presynaptic noradrenaline reuptake
  - **Drug interactions:** nil dental
  - **ADR [common]:** dry mouth, dizziness, irritability, aggression, temper tantrums
  - **ADR [infrequent]:** palpitations, orthostatic hypotension
- **Guanfacine:** selective  $\alpha_{2a}$  adrenoreceptor agonist
  - **Drug interactions:** CNS depressant, CYP3A4 inH
  - **ADR [common]:** drowsiness, dizziness, dry mouth, headache, hypotension, fatigue, sedation
  - **ADR [infrequent]:** fainting

Generic name	Brand Name
Atomoxetine	Atomoxetine
Guanfacine	Intuniv



## Drugs for ADHD

### Dental implications

- **Psychostimulants (dexamfetamine, methylphenidate, lisdexamfetamine)**
  - ADR: dry mouth, anxiety, irritability, headache, palpitations, movement disorders (rare)
  - Drug interactions: none significant in dentistry
- **Atomoxetine**
  - ADR: dry mouth, dizziness, irritability, aggression, temper tantrums, palpitations (rare)
  - Drug interactions: none significant in dentistry
- **Guanfacine**
  - ADR: drowsiness, dry mouth, dizziness, hypotension, sedation, fainting (rare)
  - Drug interactions: CNS depressants, CYP3A4 inhibitors

# Drugs for alcohol dependence

- **Alcohol withdrawal sx:** CNS depressants (benzodiazepines)
  - Symptomatic tx: analgesics, antiemetics, antipsychotics (severe agitation & hallucination)
- **Long term tx for alcohol dependence**
  - Support ongoing abstinence from alcohol.
  - Decrease alcohol intake where abstinence is not achieved.
  - Minimise social, physical and psychological consequences.
- **Drug choice**
  - **Acamprosate:** MOA unclear, nil ADR in dental
  - **Naltrexone:** [ADR] transient, subsides after 1-2wks, interact w/ opioids
  - **Disulfiram:** [ADR] drowsiness, headache, avoid metronidazole

# Drugs for nicotine dependence

- **Nicotine** : CNS stimulant → feelings of pleasure, relief of anxiety etc
  - Smoking cessation: unpleasant withdrawals
- **Non-drug treatment**: counselling, behavioural techniques, encouragement and support
- **Drug choice**
  - **Bupropion**: MOA unclear, [ADR] dry mouth, dizziness,, agitation, anxiety, tremor, headache
  - **NRT**: [ADR] dizziness, headache, burning-lip sensation (mouth spray), hiccups, cough (inhalation), vivid dreams (especially 24-hour patch)
  - **Varenicline**: [ADR] headache, taste disturbance, abnormal dreams, sleep disorder

## Drugs for opioid dependence

- Chronic, frequently relapsing illness
  - Opioids produce euphoric effects but tolerance develops rapidly
- **Withdrawals symptoms:** extreme anxiety, restlessness, insomnia, nausea, unpleasant but not life threatening
- **Drug choice**
  - **Buprenorphine:** [ADR] not dental related, interaction (opioids, ketoconazole)
  - **Methadone:** [interaction] QT prolongation
  - **Naltrexone:** already mentioned

# Substance of abuse

Drug	Dental implications
Cannabis	<ul style="list-style-type: none"><li>• Poor oral and periodontal health</li><li>• Acute dose + LA w/ adrenaline may prolong tachycardia</li><li>• Chronic smokers: oral leucoplakia, oral cancer, oral candidiasis</li></ul>
Methamphetamine	<ul style="list-style-type: none"><li>• Poor OH, rampant caries</li><li>• Bruxism, clenching, non-carious tooth wear</li><li>• Xerostomia</li><li>• LA w/ vasoconstrictor avoid when patient is intoxicated</li></ul>
Cocaine	<ul style="list-style-type: none"><li>• Bruxism, clenching, non-carious tooth wear</li><li>• Gingival erosions, retraction, ulceration</li></ul>
Opioids	<ul style="list-style-type: none"><li>• Rampant caries, periodontitis</li><li>• Anxiety</li><li>• Injectables → risks blood borne viruses &amp; infective endocarditis</li></ul>



## Drugs for dependence Dental implications

- Poor diet & oral hygiene worsen oral health
- Smoking increases risk of oral cancer
- Watch for “doctor shoppers” requesting analgesics/anxiolytics
- Know drug preferences & risks; refuse supply if unsure
- Multiple drug use common: cannabis, methamphetamine, cocaine, opioids
- Coordinate care with other healthcare providers for safe management

## References

- Ritter JM, Flower RJ, Henderson G, Loke YK, MacEwan D, Robinson E, editors. *Rang & Dale's pharmacology*. 10th ed. Edinburgh: Elsevier; 2023
- Australian Medicines Handbook Online [Internet]. Adelaide (AU): Australian Medicines Handbook Pty Ltd;2000. Psychotropics; [updated 2025; cited 2025]. Available from: UWA Onesearch
- Pharmaceutical Society of Australia. *Australian Pharmaceutical Formulary and Handbook: A Guide to Best Practice*. 25th ed. Canberra: Pharmaceutical Society of Australia; 2021
- Ali K. *Clinical dental pharmacology*. 1st ed. Oxford: Wiley-Blackwell; 2023
- Bullock S, Manias E. *Fundamentals of pharmacology*. 8th ed. Frenchs Forest, NSW: Pearson Australia; 2017
- MIMS Australia. *eMIMSelite: Consumer medicine information, specific clinical monograph* [Internet]. Sydney: MIMS Australia; [updated 2025; cited 2025 Apr 17]. Available from: UWA Onesearch

