

# **Medicines Care Guides** **for Residential Aged Care**

# Acknowledgements

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# Introduction to the *Medicines Care Guides for Residential Aged Care*

The aim of the *Medicines Care Guides* is to provide a quick medicine management reference tool for all care staff working in residential aged care in New Zealand. Guidance is provided for key medicine safety topics relevant to the care of older adults. This guidance is based on current legislation, best available evidence and published guidelines, and is consistent with the New Zealand medicines strategy, *Actioning Medicines New Zealand* (Associate Minister of Health and Minister of Health 2010).

The *Medicines Care Guides* are designed to support best practice in residential aged care environments and do not replace sound clinical judgement, facility-specific policies and procedures, or current legislation.

It is envisaged that the *Medicines Care Guides* will be utilised by managers, registered nurses, enrolled nurses, health care assistants, and other contracted health professionals who work in residential aged care facilities. Care environments include rest homes, dementia units, private hospitals, and psychogeriatric hospitals.

In utilising these guides, it is important to be aware of the context and scope for which they were developed and consider other documents that guide the provision of services in New Zealand, such as the Health and Disability Service Standards 2008.

# Medicines Management

A comprehensive medicines management system is required in residential aged care facilities to manage the safe and appropriate prescribing, dispensing, supply, administration, review, storage, disposal and reconciliation of medicines. This system must comply with legislation, regulations and guidelines. Policies and procedures should be clearly documented and available to all staff at all times. Staff involved in medicines management are required to work within their scope of practice and demonstrate their competence to provide this service. Access to specialist medicines education and advice for residents and staff must be made available. The clinical file should include documentation that records all relevant details to support safe medicines management and should comply with legislation, regulations, standards and guidelines. The safety of residents, visitors, staff and contractors must be maintained through appropriate storage and access to medicines.

## Multidisciplinary team involvement

The multidisciplinary team can include but is not limited to the following:

### Resident/Representative

- The resident or their representative is included in the multidisciplinary team and agrees to and is kept informed of medicine-related aspects of their care.

### Manager

- Contracts services of health professionals (eg, pharmacists; general practitioners, nurse practitioners, registered nurses; dietitians, etc) to support safe, resident focused medicines management
- Ensures there are sufficient appropriately qualified staff to meet the needs of the residents
- Ensures there are appropriate quality and risk management activities to support safe medicines management.

### Prescribing – Medical or nurse practitioner

- Maintains current evidence-based knowledge of medicines relevant to the care of older adults
- Provides timely, legible, accurate and legal medicine prescriptions that meet the individual needs of the residents
- Considers non-pharmaceutical alternatives
- Liaises with the pharmacist and facility staff regarding medicine prescriptions as necessary
- Liaises with the multidisciplinary team to ensure appropriate ongoing care to residents
- Provides advice and direction to staff regarding medicines' administration, monitoring and management
- Documents, diagnoses and treatment rationale in the clinical file
- Participates in medicines reconciliation for residents
- Participates in multidisciplinary medicine reviews
- Is actively involved in quality and risk management activities related to safe medicines management, including review of policy and procedures
- Provides learning opportunities for staff related to resident diagnoses and medicines management.

## Medicines Management (Continued)

### Dispensing – Pharmacist

- Maintains current evidence-based knowledge of medicines relevant to the care of older adults
- Accurately dispenses and labels medicines according to prescriptions, legislation, regulations and guidelines
- Liaises with the prescriber regarding medicine prescriptions as necessary
- Ensures timely supply/delivery of medicines ordered for residents to ensure appropriate ongoing care
- Provides advice and information regarding medicines and safe medicine management processes
- Ensures continuity of medicine supply for residents transferring in/out of the facility
- Participates in medicines reconciliation for residents
- Is actively involved in quality and risk management activities related to safe medicines management, including review of policy and procedures
- Conducts onsite medicine stocktakes
- Ensures safe and timely removal of expired, unused, damaged medicines
- Provides staff training regarding medicines and safe management processes.

### Administration – Registered nurse

- Maintains current evidence-based knowledge relevant to the care of older adults
- Assesses and identifies possible individual risk factors related to medicines
- Monitors changes in health status and responds accordingly
- Identifies signs and symptoms indicating adverse medicine reactions
- Liaises with the manager and the multidisciplinary team to provide services that meet the needs of the resident
- Participates in multidisciplinary medicine reviews
- Provides direction and/or supervision for unregulated staff as required
- Documents information regarding medicines and their effects on the resident in the clinical file
- Contacts the prescriber regarding changes in health status where necessary
- Participates in medicines reconciliation for residents
- Participates in multidisciplinary medicine reviews
- Is actively involved in quality and risk management activities related to safe medicines management, including review of policy and procedures
- Provides learning opportunities for staff.

# Medicines Administration Competency

Before giving medicines, all staff must demonstrate that they have knowledge, understanding and practical abilities to be considered as competent. Skill and knowledge will be assessed by a registered nurse who has demonstrated competency.

Safe practice includes:

- Following organisation policy
- Accurate documentation
- Correct checking procedures
- Accurate calculation if required
- Resident education and consent
- Cultural competency, including working with interpreters
- Working within defined scopes of practice and relevant legislation.

Once competent:

**Registered nurses and nurse practitioners can:**

- Check and administer all prescribed medicines
- Assess and monitor for effect or reaction.

**Enrolled nurses can:**

- Check and administer oral, topical and rectal medicines and intramuscular and subcutaneous injections under the direction and delegation of a registered nurse.

**Health care assistants/caregivers can:**

- Check and administer oral, topical and rectal medicines and under the direction and delegation of a registered nurse (eg, oral from a unit dose pack [blister pack], topical medicines, suppositories). Insulin administration specific competence is required for administering subcutaneous insulin.

For more on scopes of practice, refer: Nursing Council of New Zealand:  
[www.nursingcouncil.org.nz](http://www.nursingcouncil.org.nz)

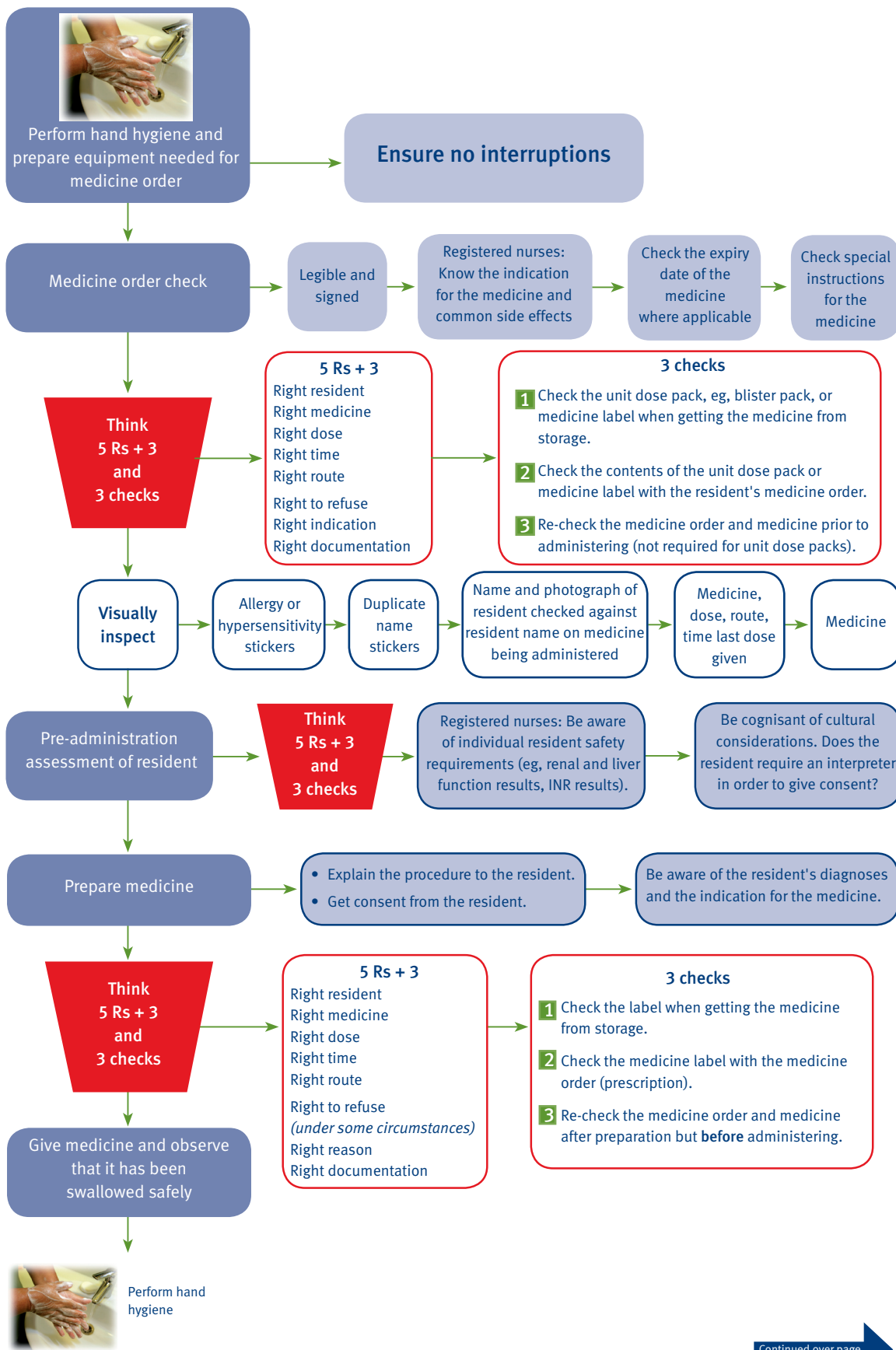
For more on resident rights and responsibilities, refer: New Zealand Health and Disability Sector Standards NZS8134:2008

For staff administering medicines, education should be provided during orientation and reviewed at least annually.

**Bureau staff**  
Bureau staff should be orientated to organisational policies and procedures that are applicable to the shift.

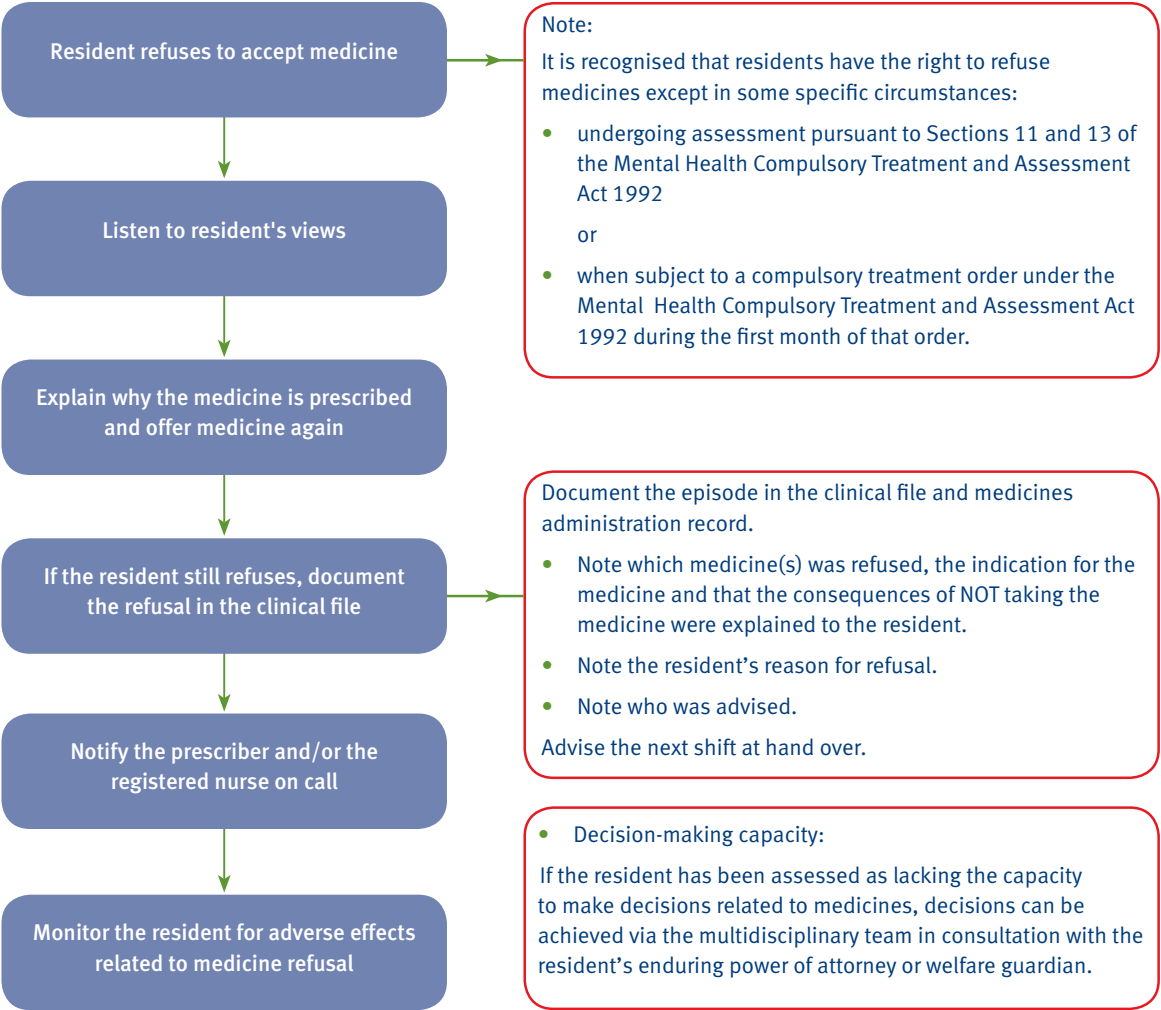
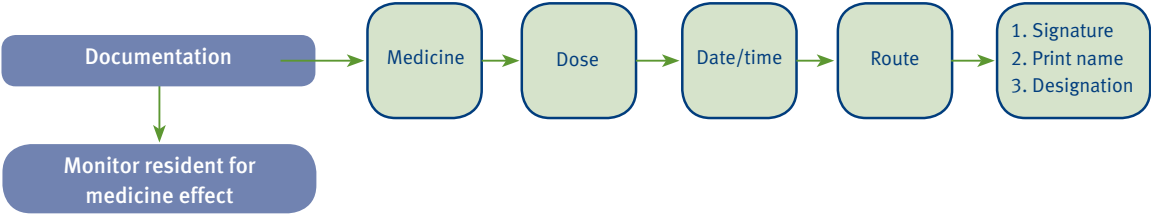
Medicines competency assessments can be included in annual audit schedules.

# Medicines Administration Safety



Continued over page

# Medicines Administration Safety (Continued)



# Documentation, Incident Reporting and Quality Activities

## Medicine order charts

- Record all medicines prescribed by authorised/designated prescribers.
- Record all medicines on the medicines chart, including complementary and general sales items.
- Record all allergies and sensitivities to medicines in a prominent position.
- Check out controlled drugs as close as possible to, and preferably immediately before, administration time.
- Sign the medicine administration record immediately after administration.
- Document refusals (refer to the Medicines Administration Safety page in this guide).

## Resident education and information

Document the education and/or information provided to the resident or their representative regarding medicines in the resident's clinical file.

## Resident's response to medicines

Document the effect of medicines on the resident in their clinical file, including all adverse medicine reactions.

## Medicine reviews

Record all medicine reviews in the clinical file.

## Referrals

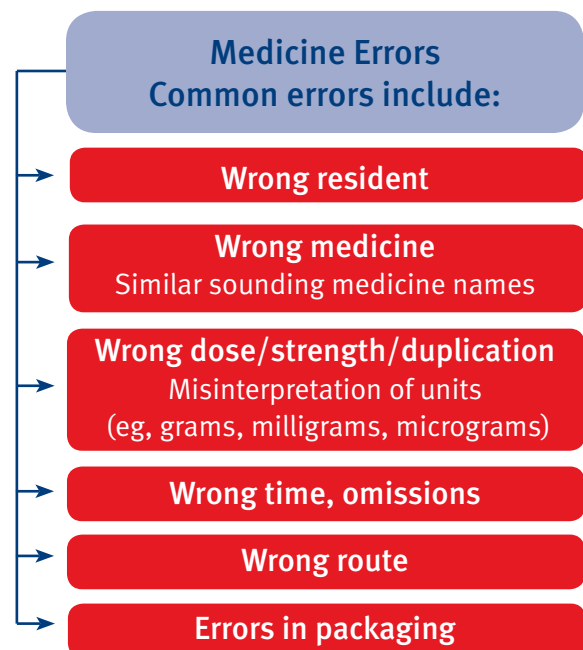
Maintain a copy of referrals to other health professionals related to a resident's medicines management in their clinical file.

## Incident reporting

- Record all medicine errors on an incident form.
- Notify the senior RN immediately and/or the prescriber, and monitor the resident as advised.
- Inform the resident or activated enduring power of attorney (EPOA), welfare guardian or designated representative.
- Notify pharmacy of incidents related to pharmacy supply and medicine management processes.

## Photos

Date photos used to identify residents and ensure they resemble their current appearance.



## Documentation, Incident Reporting and Quality Activities (Continued)

### Quality and risk activities

- Encourage a quality improvement approach.
- Analyse incidents and complaints via quality and risk management processes to eliminate, minimise and control future medicine management risks.
- Monitor antimicrobial prescribing to minimise the risk of the development of multi-drug-resistant organisms.
- Audit compliance with medicine management policies, procedures and documentation to identify and improve areas of non compliance.
- Involve the pharmacist and prescribers in quality and risk management activities related to medicines.
- Monitor staff, prescriber, pharmacy and resident satisfaction with medicine management processes.
- Incorporate key findings in future staff education.
- Document system improvements.
- Report quality and risk activities to governance.
- Disseminate information of evidence-based medicine management to relevant staff.

### Legal considerations

These include:

- professional accountability
- complete documentation of events.

#### Special authority

Complete appropriate form from the website:

[www.pharmac.govt.nz/schedule/saforms](http://www.pharmac.govt.nz/schedule/saforms)

# Adverse Medicine Reactions

An adverse medicine reaction is any unexpected, unintended, undesired or excessive response to a medicine that:

- 1 requires discontinuing the medicine
- 2 requires changing the medicine
- 3 necessitates acute admission to a public hospital
- 4 results in temporary or permanent harm, disability or death.

Any *suspected* adverse reactions should be reported to the Centre for Adverse Reactions Monitoring. You do not have to be certain, just suspicious to report.

## Reporting Adverse Medicine Reactions

Centre for Adverse Reactions Monitoring (CARM)



<http://CARM.otago.ac.nz>  
Ph 03 479 7247 Fax 03 479 7150  
Email [carmnz@stonebow.otago.ac.nz](mailto:carmnz@stonebow.otago.ac.nz)

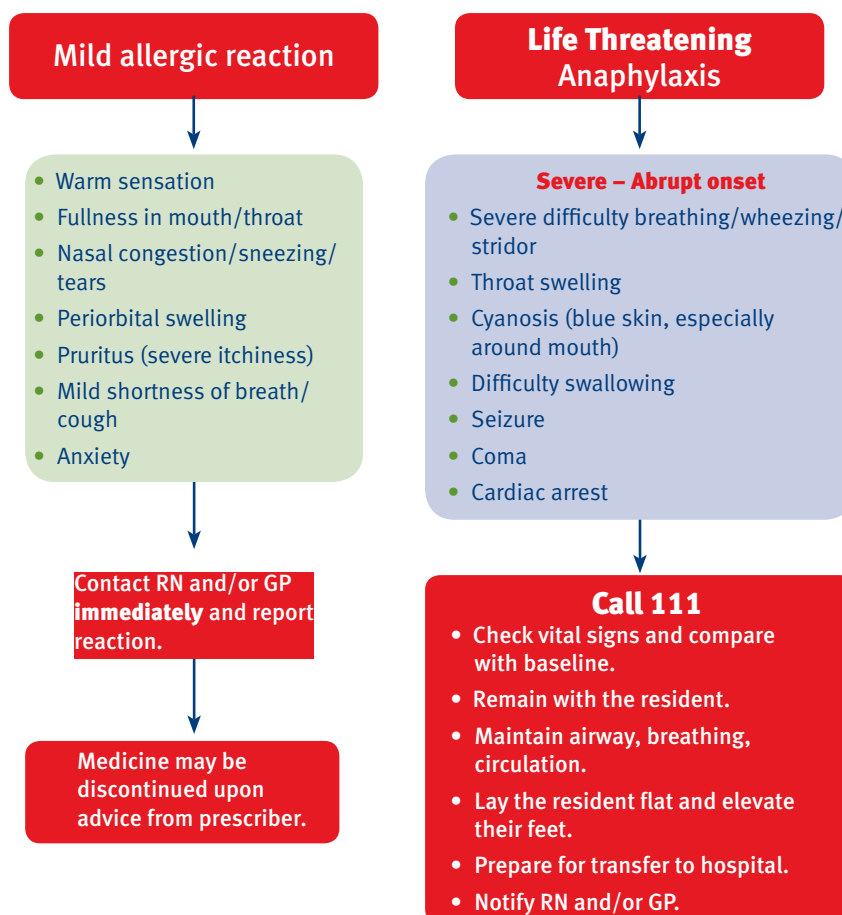
You can find known adverse reactions to medicines from the data sheet published on the Medsafe website <http://www.medsafe.govt.nz/profs/Datasheet/dsform.asp>

A **side effect** is a predictable effect of the medicine, and it may be desirable or undesirable.

An **adverse medicine reaction** is always undesirable and may not be predictable.

A true medicine **allergy** results in a physical allergic reaction (see below).

## Allergic reaction management



# Adverse Medicine Reactions – Contributing factors to adverse reactions

Inform the prescriber immediately with pharmacist notification of potential interactions or adverse reactions.

Multiple co-morbidities	A medicine can improve one condition and worsen another.
Reduced renal function	This can be due to ageing and acute illness.
Increased sensitivity to the effects of medicines with age	Cell mediator receptors and target organs have reduced ability to compensate.
Reduced ability to metabolise medicines	The liver, lungs and kidneys become less able to metabolise medicines with age.
Female gender	This may reflect a woman's relatively smaller size for given medicine doses.
Dose	Many adverse effects are dose related, and identifying the right dose can be made more difficult due to weight and body composition in older adults.
Polypharmacy	The incidence of adverse effects tends to increase with the number of medicines taken.
History	A history of significant adverse effects to medicines increases the risk of further adverse reactions.
Genetic factors	Hereditary factors can determine the relative deficiency of enzyme(s) involved in the metabolism of some medicines, which can increase the risk for adverse reactions.
Not taking medicines as prescribed	Poor adherence may be unintentional, or intentional due to resident confusion, complex medicine regimens, side-effects, adverse medicine reactions or medicine costs.

Antibiotics, anti-inflammatories and antihypertensives are the most common causes of adverse medicine reactions in older adults.

# Controlled Drugs

## Security: Controlled drugs via bulk supply order (hospital only)

- Keep controlled drugs in a locked controlled drug cabinet accessible **ONLY** to authorised staff.
- Record all controlled drugs transactions in a **CONTROLLED DRUGS REGISTER**.
- The keys to controlled drugs should be held by **ONE** senior authorised staff member on each duty.
- Maintain a list of the staff authorised to handle controlled drugs.

## Storage of prescription forms for controlled drugs

Keep controlled drug order forms locked in the controlled drugs cabinet.

## Storage

- It is recommended that controlled drugs be checked in/out by the **PERSON DELIVERING/ TAKING** the stock with the **RN** on duty and documented in the Controlled Drugs Register.
- Expired and unused stock should be collected and safely disposed of by the contracted pharmacy.

## Rest home

Controlled drugs can only be provided by individual named prescription and must be kept in a controlled drugs cabinet or locked cupboard. It is recommended that two staff, one of whom has demonstrated medicines management competency, check and sign for controlled drugs.

## Reconciliation

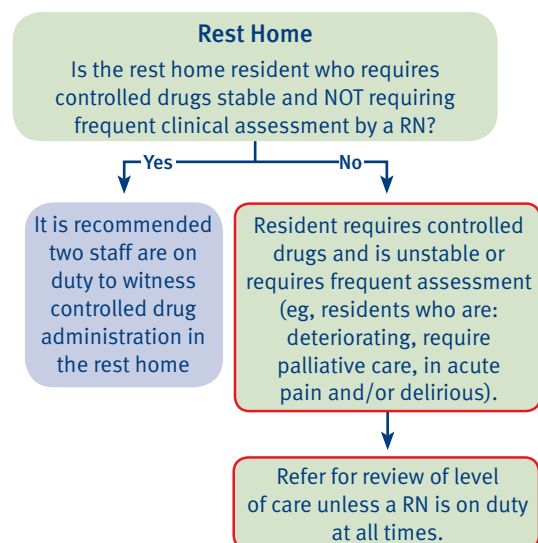
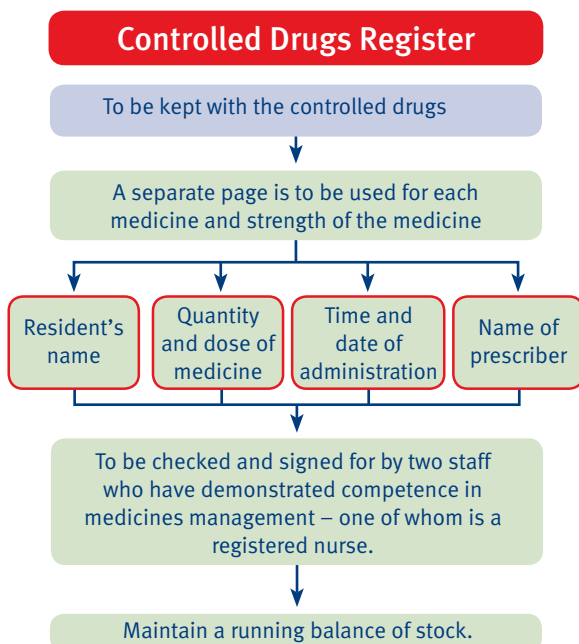
- Record the weekly stock count in **red** in the Controlled Drugs Register.
- Complete a six-monthly stocktake and reconciliation, and record this in the Controlled Drugs Register.
- Record errors/alterations in a margin or footnote.
- Record wasted/expired and unwanted controlled drugs in the Controlled Drugs Register.
- Report the loss of controlled drugs to the manager when first identified, and investigate. Where controlled drugs cannot be accounted for, notify HealthCERT, the Nursing Council or the Police, as appropriate.

## Risks and benefits

Controlled drugs can provide considerable therapeutic benefit, but they can also have serious adverse effects (eg, respiratory depression).

They should only be administered by staff who are trained in how to monitor residents for potential adverse effects.

For those residents who have recently started a controlled drug, skilled assessment of treatment efficacy is required and should be carried out by a health professional whose scope of practice includes clinical assessment (eg, a registered nurse).



# Medicines Reconciliation

## WHAT?

Definition: A process to collect, compare and communicate the most accurate list of all medicines a resident is taking, together with details of any allergies and/or adverse medicine reactions, with the goal of providing correct medicines for a given time period at all transition points.

## WHEN?

Medicines reconciliation should be carried out when residents go to and from residential aged care (ie, all admissions, transfers and discharges). Visiting clinicians may also complete medicines reconciliation.

## WHO?

Medicines reconciliation should be performed by health practitioners such as general practitioners, nurse practitioners, other authorised/designated prescribers, pharmacists or registered nurses.

## WHY?

Medicines reconciliation identifies:

- omissions
- temporarily stopped medicines
- medicines not restarted
- duplicated orders
- incorrect medicines
- dosage/route discrepancies
- up and down titration of medicines.

## HOW?

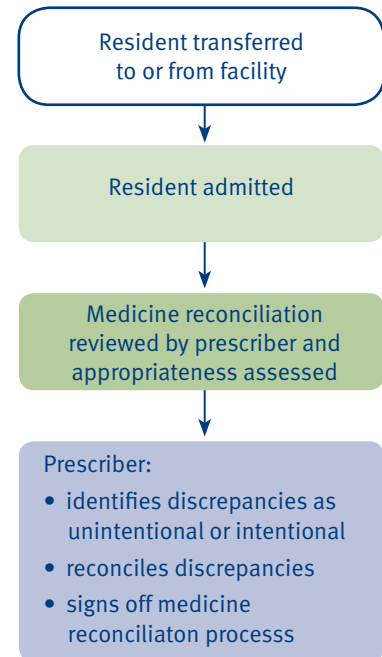
COLLECT medicines and information from multiple sources – do not rely on one source.

- Ask the resident and/or their carer what medicines they are actually taking, including nutritional supplements, non-oral medicines such as inhalers, complementary medicines, and non-prescription medicines.
- Ask the family to bring medicines from home.
- Identify allergies to medicines and previous adverse reactions to medicines.
- Check previous medicines charts from prior admissions to the facility.
- Liaise with the resident's usual dispensing pharmacy.
- Liaise with the medical practice where the resident is usually seen for an up-to-date list.
- Review discharge transfer documentation, clinic and specialist letters – do not rely on the discharge summary.

COMPARE collected medicines and information with the current medicines chart:

- identify differences in medicines, allergies and adverse reactions to medicines.

COMMUNICATE discrepancies to the resident's prescriber (medical or nurse practitioner).



## Medicines Reconciliation – Example

Medicines prior to admission (4)	Discharge medicines (5)	Change	Reason/comment
Diclofenac sodium (Apo-Diclo SR tablets) 75 mg Long-acting tablets 1 tab BD for pain PRN	–	Stopped	Stopped due to deteriorating renal function
Warfarin sodium (Marevan) 1 mg tablets Take as per INR; usually 4 mg daily	Warfarin sodium (Marevan) 1 mg tablets Take as per INR, usually 4 mg daily	Continued	
Alendronate sodium and cholecalciferol (Fosamax Plus 70 mg/140 mcg) tablets 1 tablet weekly on Wednesday	Alendronate sodium and cholecalciferol (Fosamax Plus 70 mg/140 mcg) tablets 1 tablet weekly on Wednesday	Continued	
Slow sodium 600 mg tablets 2 tablets BD	Slow sodium 600 mg tablets 2 tablets BD	Continued	
–	Paracetamol (Pharmacare Paracetamol) 500 mg tablets 2 tablets QID  1 month <input checked="" type="checkbox"/> Script <input type="checkbox"/> Close control	Started	To manage pain without diclofenac
–	Morphine sulfate (Sevredol) 10 mg tablets 1 tablet q3h for severe pain PRN  20 tablets <input checked="" type="checkbox"/> Script <input type="checkbox"/> Close control	Started	To manage pain without diclofenac

# Medicines Ordering – Receiving, storing and returning

## Ordering

- All medicines must be legibly and indelibly printed on the resident's medicine chart.
- Each medicine ordered must be signed and dated by the prescriber.
- A signed order should be sent to the pharmacy.
- Avoid transcription.
- The prescriber's registration number must be included on all prescription forms.

## Resident's medicine chart includes:

1. Resident's name/date of birth/NHI
2. Address
3. Date of order
4. Medicine
5. Strength
6. Dose
7. Time
8. Route
9. Frequency
10. Duration
11. Special and resident-specific orders
12. Signature and name of prescriber
13. Allergies and adverse medicines reactions.

It is recommended that the prescriber's registration number also be included on the medicine chart.

## Urgent verbal orders

- The RN records the name of the prescriber, resident, date and medicine order.
- Where possible, the prescriber faxes a copy of the order to the facility and the pharmacy.
- The prescriber must sign the order on the medicine chart within the next two working days.

## Receiving

- Medicines must be checked against the medicine chart on arrival at the facility by a staff member who has demonstrated medicines management safety competency.
- A record of items received must be maintained.

## Storing

- Store in a locked room, dedicated medicines refrigerator or medicines cupboard free from heat, moisture and light, as per recommendations.
- Store dispensed medicines in the original unit dose packs or containers until administered.
- Keep medicine storage areas locked when unattended and below 25°C.
- Keys must be safeguarded by a designated staff member on duty who has demonstrated competency in medicines management safety.
- Restrict access to authorised staff only.
- Ensure medicines are clearly dated and labelled. **NEVER** re-label or write on the medicines label.
- Store oral and topical preparations separately.
- Record the date medicines are opened, such as eye drops.
- Keep storage areas clean and organised.
- Check monthly for expired, damaged and unused medicines.

## Refrigeration

- Medicines requiring refrigeration should be kept in a medicines-dedicated fridge.
- Maintain the temperature recommended for medicines being stored (usually 2–8°C).
- Record the weekly temperature check.
- Notify appropriate staff to ensure corrective action is taken if the temperature is outside the required range.
- Keep medicines secure from residents/visitors and unauthorised staff at all times.

## Medicines Ordering – Receiving, storing and returning (Continued)

### Returning

- Return unused, expired and damaged medicines, including PRN medicines, to the pharmacy for safe disposal.
- Keep returns in a designated secure area, separate from medicines for administration, until they are returned.

### Changing medicine orders, including changing unit dose packs and discharged/deceased residents

- Send new medicine orders to the pharmacy to ensure a supply is received within an appropriate timeframe.
- Return unused medicines to the pharmacy.
- Notify the pharmacy of discharged and deceased residents in a timely manner.

### Resources

- Provide access to current medicines information resources for the staff, residents and health professionals.

### Sharing medicines

- Never give medicine to anyone other than the person for whom it is labelled.

### Bulk supply

- Bulk supply is only suitable for facilities with hospital certification.
- Rotate stock, so that first in is first out.
- Review and rationalise the bulk supply list regularly.

# Cytotoxic Medicines

<b>What?</b>	<ul style="list-style-type: none"><li>• Cytotoxic medicines have the ability to kill or slow the growth of living cells and are used to treat conditions such as cancer, rheumatoid arthritis and myeloproliferative disorders.</li><li>• They are also sometimes referred to as antineoplastic or chemotherapy medicines.</li><li>• The cytotoxic dosage will vary widely with the condition being treated (eg, oral methotrexate has a dosage regime of once weekly for rheumatism).</li></ul>
<b>Cytotoxic medicines</b>	<p>The following cytotoxic medicines are sometimes prescribed for residents in residential aged care:</p> <ul style="list-style-type: none"><li>• methotrexate</li><li>• hydroxyurea</li><li>• chlorambucil</li><li>• cyclophosphamide</li><li>• azathioprine</li><li>• fluorouacil.</li></ul>
<b>Hazard alert</b>	<ul style="list-style-type: none"><li>• Cytotoxic medicines can also be highly toxic to non-target cells.</li><li>• There is a potential risk to staff and family from handling medicines or from resident secretions or excretions.</li><li>• <b>Observe barrier precautions and safe handling practice to minimise risk.</b></li><li>• Liaise with the pharmacist for advice and queries.</li></ul>
<b>Storage</b>	<p>Cytotoxic medicines should be stored in a locked cabinet, in a locked medicine room, separate from other medicines.</p>
<b>Cytotoxic medicine returns</b>	<ul style="list-style-type: none"><li>• Return unused, expired and damaged medicines to the pharmacy for safe disposal.</li><li>• Keep in a designated secure area separate from medicines for administration until returned.</li></ul>

## Cytotoxic Medicines (Continued)

### Administration

- Follow safety procedures.
- Avoid unnecessary contact with the medicine.
- Dispose of contaminated items into a purple hazardous/cytotoxic disposal container.
- Monitor residents for adverse effects, particularly signs of infection.

**Never cut or crush cytotoxic medicines.**

If the resident is unable to swallow the medicine, notify the prescriber.

### Adverse effects from cytotoxic medicines include

- skin rashes
- abdominal pain
- hair loss
- nasal sores and mouth ulcers
- nausea and vomiting
- liver damage
- alterations to normal blood cell count
- cancers
- mutagenic (cause changes to genetic DNA) and teratogenic (cause birth defects) effects.

# Residents Self-Medicating

There are many reasons why it might be preferable for residents to self-medicate (eg, to maintain autonomy or as part of a rehabilitation programme). A supervised trial may be needed to assess ability to self-medicate safely. As part of the assessment, it may be beneficial to ask the resident what they know about their medicines and conditions, which medicines are actually being taken and how they take them, and any beneficial and/or unwanted effects experiences they have had.

## Assessing capacity for self-mediation

- A RN or prescriber completes a capacity assessment to assess cognitive and physical ability to self-medicate, signed off by their regular prescriber prior to self-medicating.
- Review every three months and when there is a change of health status, including an improvement in health.
- Review if the resident does not adhere to the prescribed regimen.
- Residents wishing to self-medicate should sign an agreement regarding their responsibilities for safety.
- Clearly label any medicines still to be given by staff and mark accordingly on medicines chart.

## Alternative medicines

- Include over-the-counter, complementary, homeopathic, naturopathic, traditional and supplementary medicines on the medicines chart as these can sometimes cause side effects, adverse drug reactions and interactions.
- Consult with appropriate cultural advisors (as necessary) regarding traditional medicines.

## Monitoring and documentation

- Identify on the medicines chart that the resident is self-medicating.
- Check with the resident that they have taken all medicines each shift.
- Monitor and document any side effects or adverse drug reactions.
- Liaise with the prescriber and pharmacist regarding all relevant resident and/or staff feedback.

## Storage

- Provide locked storage that is only accessible to the resident and authorised staff.
- Consider safety of other residents and visitors.
- Liaise with pharmacist regarding special storage instructions.

## Resident responsibilities

- Keep medicines secure at all times.
- Inform staff of any complementary medicines being used.
- Notify staff of any changes to regimen, side effects, adverse effects or difficulties self-medicating.
- Notify staff if medicine stock is getting low to enable sufficient time to reorder.

## Medicines management for facility leave

- Document in the clinical file who is taking responsibility for medicines management while resident is on leave.
- A staff member who has demonstrated medicines management competency gives a designated person the medicines for the period of leave only and provides necessary education/information to ensure safety.
- Ensure all medicines are appropriately packaged and labelled; liaise with pharmacist as necessary.

## Respice care

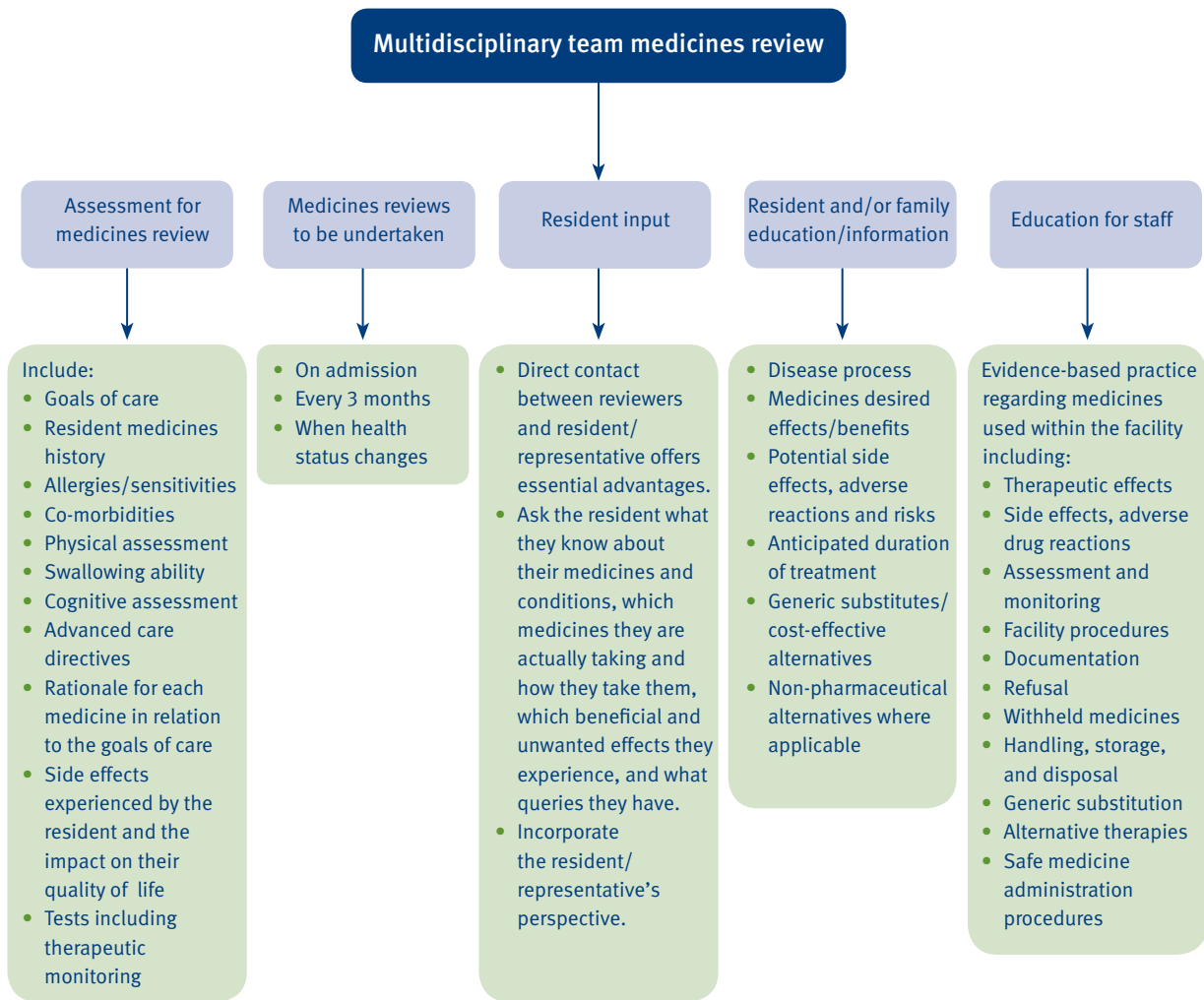
- Confirm regular medicines with prescriber prior to admission.
- Complete medicines reconciliation on admission.
- Document in the clinical file any changes while in care.
- Notify permanent carer and prescriber of any changes to medicines regime.
- Provide information/education as appropriate to resident/carer.
- Document information/education provided in the clinical file.
- Complete medicines reconciliation on discharge and ensure resident has access to correct medicines for discharge.

# Residents Self-Medicating – Factors to consider

Use the following guide to assess a resident’s ability to self-medicate safely. If their ability is on the **blue** end of each indicator, they are likely to be able to self-medicate. However, if their ability for any indication is on the **red** section, the ability to self-medicate is questionable.

		Self-medication risk				
		Low	Medium	High		
Safe self-medication ability	<b>Medicine</b>	Minimal side effects/adverse effects	Some adverse effects not serious	Narrow therapeutic index, potentially serious adverse effects	Unsafe self-medication ability	
	<b>Administration difficulty</b>	Topical/oral	Subcutaneous/intramuscular/rectal/vaginal	Intravenous infusion/pump		
	<b>Functional ability</b>	Independent/previous self-medication	Some functional dependency	Dependent		
	<b>Environment</b>	Own home/supported living	Rest home/private hospital	Hospital ward/intensive care unit		
	<b>Monitoring required</b>	Responses easily judged	Simple questions/physical, cognitive assessment	Complex monitoring and assessment		
	<b>Packaging/regimen complexity</b>	Unit dose packaging (eg, blister-packed)	Simple regimen Few changes	Moderately complex regimen		Complex regimen Frequent changes

# Medicines Review



**Multidisciplinary team can include but is not limited to:**

- Resident or their representative
- Pharmacist
- General practitioner/geriatrician/psychogeriatrician
- Registered nurse/nurse practitioner
- Dietician
- Podiatrist
- Physiotherapist
- Occupational therapist
- Other allied health professionals

## Medicines Review (Continued)

**WEIGH UP RISKS VERSUS BENEFITS** Why is this medicine being given?  
When stopping medicines, consider reducing them gradually as stopping medicines abruptly can cause unwanted effects.

### Treatment considerations

For the resident being reviewed, consider stopping medicines that:

- do not have well-established effectiveness
- do not have sound rationale for use.

Consider stopping medicines that are potentially inappropriate for the resident because of:

- development of an adverse effect/drug interaction
- inconsistency with current goals of therapy (eg, end of life care)
- the resident's life expectancy
- other co-morbidities.

Consider starting preventative medicines that are consistent with the resident's goals.

### Prescription considerations

Consider the possibility that:

- the resident is taking more of the medicine than prescribed
- the resident is taking less than or none of the medicine prescribed
- there is potentially inappropriate duplication of treatment
- one or more medicines may have been added to an existing regimen to combat an adverse effect of one or more medicine already being taken.

Consider the possibility that medicines may be substituted by:

- equally or more effective generic equivalents that are less expensive
- more effective therapeutic equivalents that are less expensive.

Consider appropriateness of:

- dosage, duration, formulation
- PRN medicines (eg, should they be re-charted for regular dosing or stopped if not being used?).

## STOPP Criteria (Galagher 2008)

The STOPP (Screening Tool of Older Persons' Potentially Inappropriate Prescriptions) criteria are focused on avoiding the use of medicines that are potentially inappropriate in older adults. The criteria are organised by organ system (eg, cardiovascular system, central nervous system, etc).

General considerations	Condition(s)	Potential risk
Duplication of medicines that are in the same class (eg, two concurrent opiates, NSAIDs, SSRIs, loop diuretics, ACE inhibitors)	Multiple conditions	The optimisation of the monotherapy within a single medicines class should be observed before considering a new class of medicines.
Benzodiazepines, antipsychotic medicines (neuroleptics), first-generation antihistamines, vasodilator medicines known to cause hypotension, long-term opiates	High risk of falls (> 1 fall in past 3 months)	These medicines adversely affect those residents who are prone to falls.
Cardiovascular system	Condition(s)	Potential risk
Digoxin > 125 ug	Impaired renal function	Increased risk of toxicity.
Loop diuretic for dependent ankle oedema	No clinical signs of heart failure	Compression therapy may be more appropriate.
Loop diuretic	Not appropriate as first-line treatment for hypertension	Safer, more effective alternatives are available.
Thiazide diuretic	History of gout	Could exacerbate gout.
Non-cardiovascular beta blocker	COPD	Risk of bronchospasm.
Beta blocker	In combination with verapamil	Risk of symptomatic heart block.
Diltiazem or verapamil	With NYHA class 3 or 4 heart failure	Worsen heart failure.
Calcium channel blockers	Chronic constipation	May worsen constipation.
Aspirin and warfarin	Without the use of histamine H2 receptor antagonist or proton pump inhibitor	Creates high risk of gastrointestinal bleeding.
Dipyridamole as monotherapy	For cardiovascular secondary prevention	There is no evidence of efficacy.
Aspirin with history of peptic ulcer disease Aspirin dose >150 mg/day	Without the use of proton pump inhibitor or histamine H2 receptor antagonist	Increased risk of bleeding. Increased risk of bleeding and no evidence of efficacy.
Warfarin	First treatment of uncomplicated DVT duration longer than 6 months or treatment of PE for longer than 12 months	No proven added benefit.

## STOPP Criteria (Galagher 2008) (Continued)

Urogenital system	Condition(s)	Potential risk
Bladder anti-muscarinic medicines	Patients with dementia	Risk of increased confusion and agitation.
	History of glaucoma	Increased risk of acute exacerbation of glaucoma.
	With chronic constipation	Increased risk of exacerbation of constipation.
	With history of chronic prostatism	Increased risk of urinary retention.
Alpha blockers	In male clients with frequent incontinence (one or more incontinence episodes per day)	Increased risk of increasing urinary frequency and worsening of incontinence.
	With clients that have long-term in-dwelling catheters (longer than 2 months)	This medicine is not appropriate/indicated.
Respiratory system	Condition(s)	Potential risk
Theophylline	As the monotherapy for COPD	There are safer and more effective alternatives. Risk of adverse effects due to narrow therapeutic index.
Systemic corticosteroids	Instead of inhaled corticosteroids for maintenance therapy in moderate to severe COPD	Unnecessary exposure to the long-term effects of systemic steroids.
Nebulised Ipratropium	With history of glaucoma	May cause exacerbation of glaucoma.
Endocrine system	Condition(s)	Potential risk
Glibenclamide or chlorpropamide	With type 2 diabetes mellitus	Increased risk of prolonged hypoglycaemia.
Beta blockers	With diabetes mellitus and frequent hypoglycaemia (one or more episodes per month)	Has the risk of masking hypoglycaemic symptoms.
Oestrogens	With history of breast cancer or venous thromboembolism	Increased risk of recurrence.
	Without progestogen in patients with intact uterus	Increased risk of endometrial cancer.

## STOPP Criteria (Galagher 2008) (Continued)

Analgesic medicines	Condition(s)	Potential risk
Use of long-term powerful opiates (eg, morphine)	For first-line therapy for mild to moderate pain	Not appropriate as per WHO analgesic ladder for pain control.
Regular opiates for more than 2 weeks	With chronic constipation without use of concurrent laxatives	Increased risk of severe constipation.
Long-term opiates in those with dementia	Unless indicated for palliative care of management of moderate to severe pain	Increased risk of exacerbation of cognitive impairment.
Musculoskeletal system	Condition(s)	Potential risk
Non-steroidal anti-inflammatory medicines (NSAID)	With history of peptic ulcer disease	Increased risk of peptic ulcer relapse.
	With moderate to severe hypertension	Increased risk of exacerbation of hypertension.
	With heart failure	Increased risk of exacerbating heart failure.
	With chronic renal failure	Increased risk of deterioration in renal function.
Long-term use of NSAID > 3 months	For relief from mild joint pain in osteoarthritis	Other simple analgesia preferable and usually as effective.
Long-term corticosteroid use > 3 months	As monotherapy for rheumatoid arthritis or osteoarthritis	Risk of major systemic corticosteroid side effects.
Warfarin and NSAID prescribed together		Increased risk of GI bleeding.
Long-term NSAID or colchicine use	For chronic treatment of gout where no contraindication to allopurinol	Allopurinol is the first choice of prophylactic medicine in the treatment of gout.
Aspirin, clopidogrel, dipyridamole or warfarin	With a concurrent bleeding disorder	Creates a high risk of bleeding.

## STOPP Criteria (Galagher 2008) (Continued)

CNS and psychotropic medicines	Condition(s)	Potential risk
Tricyclic antidepressants (TCAs)	With history of dementia	Increased risk of worsening cognitive impairment.
	With history of glaucoma	Likely to exacerbate glaucoma.
	With cardiac conductive abnormalities	Possible proarrhythmic effects.
	With constipation	Likely to worsen constipation.
	Prescribed with opiate or calcium channel blocker	Increased risk of severe constipation.
	With history of prostatism or history of urinary retention	Increased risk of urinary retention.
Long-term (> 1 month), long-acting benzodiazepines	Prescribed medicines with long-acting metabolites (eg, diazepam)	Increased risk of prolonged sedation, confusion, impaired balance, falls.
Long-term (> 1 month) antipsychotic medicines (neuroleptics)	For long-term hypnotics	Increased risk of confusion, hypotension, falls, extrapyramidal side effects.
	For those with Parkinsonism	Likely to worsen extrapyramidal symptoms.
	For those with epilepsy	May lower seizure threshold.
	To treat extrapyramidal side effects of neuroleptic medicines	Increased risk of anticholinergic toxicity.
Selective serotonin re-uptake inhibitors (SSRIs)	With history of clinically significant hyponatremia	Older people are at high risk for hyponatremia exacerbation by SSRIs.
Prolonged use (> 1 week) of first-generation antihistamines		Increased risk of sedation and anticholinergic side effects.

## STOPP Criteria (Galagher 2008) (Continued)

Gastrointestinal system	Condition(s)	Potential risk
Diphenoxylate, loperamide or codeine phosphate	For treatment of diarrhoea with an unknown cause	Increased risk of delayed diagnosis and/or exacerbation of some conditions.
	In the treatment of severe infective gastroenteritis	Increased risk of exacerbation or protraction or infection.
Prochlorperazine or metoclopramide	With Parkinsonism	Increased risk of exacerbation of Parkinsonism.
Proton pump inhibitors (PPI) for peptic ulcer disease	With full therapeutic dosage taken for > 8 weeks	Consideration is needed for earlier discontinuation or dose reduction for some identified conditions.
Anticholinergic antispasmodic medicines	Chronic constipation	Increased risk of exacerbation of constipation.

### Abbreviations:

NSAIDs – non-steroidal anti-inflammatory drugs, SSRIs – selective serotonin reuptake inhibitors, ACE – angiotensin converting enzyme, COPD – chronic obstructive pulmonary disease, NYHA – New York Heart Association, DVT – deep vein thrombosis, PE – pulmonary embolism, GI – gastrointestinal, WHO – World Health Organization, CNS – central nervous system

# Strategies to Reduce the Use of Antipsychotic Medicines

Antipsychotic medicines are prescribed to treat symptoms of mental illness (eg, psychosis and mania) and delirium symptoms, as well as symptoms of behavioural and psychological symptoms of dementia (BPSD). However, the use of these medicines should be limited, closely monitored by the multidisciplinary team, and decreased or discontinued whenever possible.

## 1 Improve assessment

- Look for delirium and treat the underlying cause (eg, constipation).
- Do a comprehensive physical assessment.
- Assess for depression.
- Is there unrecognised pain?
- Are existing medicines causing problems?
- Take a person-centred approach to understand the cultural, social and spiritual contributors.

## 2 Improve the behavioural approach to management of behavioural and psychological symptoms of dementia (BPSD)

Non-pharmacological interventions such as the following have evidence of effectiveness:

- structured social interaction
- personalised music
- massage
- pet therapy
- exercise and dance programmes.

## 3 Family/carers – consult and consent

Because of the high rate of adverse events, families and carers need to be involved in the decision to use antipsychotics. They will be able to give guidance on managing the behaviour, based on their experience.

## 4 Targeted prescribing of antipsychotics

- Use only for severe distress or danger to self or others.
- Describe the target behaviour clearly (eg, what symptom or behaviour are you trying to modify?)
- Use mainly for hallucinations; delusions; or persistent, driven, angry, extremely anxious or aggressive states.

Antipsychotics are unlikely to be useful when:

- the behaviour is intermittent
- the behaviour is situation-specific (eg, resisting showers vs resisting all care)
- the behaviour is goal directed
- there is apathy, wandering (we all need to walk about), calling out, mood disorder
- loss of toileting skills or sexual behaviour in the wrong context.

## Strategies to Reduce the Use of Antipsychotic Medicines (Continued)

### 5 Review, reduce and stop

- For delirium, review at one week. In general, as the underlying illness resolves so does the behavioural issue.
- For dementia, the nursing and care staff need to be reviewing the response to medicines in conjunction with a behavioural approach. Use an interdisciplinary team approach.
- Set a goal, start low, go slow (weekly and modest increments), get control, maintain and review at one month.
- Continue to use an objective measure of the target behaviour. When the behaviour has settled and been maintained for three months, then slowly reduce medicine/dose by 25 percent every two weeks.
- Consider the restraint standard: document treatment goal and review processes.
- Monitor symptom management effectiveness.

### 6 For residents already on antipsychotic agents for dementia

- Consult with the resident's specialist if they have one. If the behaviour is stable, there should still be a regular review with the goal of reducing the dose and stopping it eventually.
- If the resident has been stable for three months, consult with the prescriber to cautiously reduce the dose (25%) and review every two weeks.

### 7 For residents on antipsychotic agents for other psychiatric illnesses

If they are under the active care of a specialist, consult with them before making any adjustments.

### 8 For residents with dementia with Lewy bodies and/or Parkinson's disease

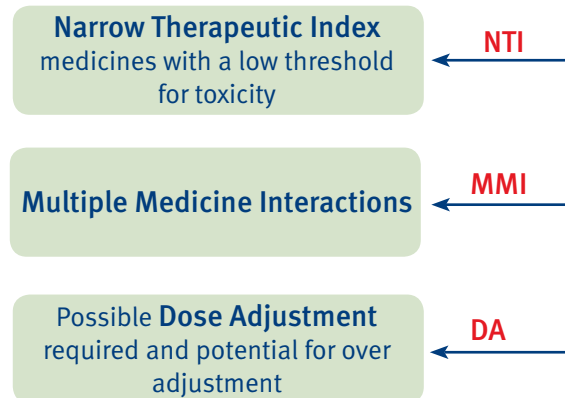
- Antipsychotic agents are generally contraindicated.
- Seek specialist advice.

# Medicines Effect Monitoring

## Commonly used high-risk medicines

All medicines have side effects, but some medicines are particularly high risk for adverse effects.

### Medicines can be high risk due to:



### There are many high-risk medicines, but common ones include:

Digoxin NTI, MMI	Phenytoin NTI, MMI	Warfarin MMI, DA	Insulin DA
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For more information see:  
Controlled Drugs page 11  
STOPP Criteria pages 23–27  
High-Risk Medicines pages 31–33  
Gentamicin page 41

## Things to look for when new medicines are prescribed

### 1. Changes from baseline observations

These include:

- heart rate
- respiratory rate
- blood pressure (lying, sitting and standing)
- weight.

### 2. Consider changes in renal function

- Review creatinine levels and input/output prior to and one week post change.

### 3. New behaviour changes and possible signs and symptoms of delirium

### 4. Effect of new medicine on existing medicines

- New medicines can interact with existing medicines and cause adverse effects or reduce the effectiveness of one or more medicines. For example, antifungals and antibiotics can interfere with the metabolism of warfarin in the liver and alter INR significantly.

### 5. Possible food or alcohol interactions

- For example, alcohol can greatly increase the effects of sedating medicines.

### 6. Complementary medicine interactions

- For example, St John's Wort can interact with warfarin and antidepressants, resulting in adverse reactions.

### 7. Has the medicine had its intended effect?

#### DO NOT CRUSH

Medicines labeled as per below cannot be crushed, although some can be halved.

Check with the pharmacist before altering.

Some medicines are formulated to release the medicine in a controlled manner over a defined dosing period, usually 12 to 24 hours. Crushing these medicines may result in altered absorption or an unintended large bolus dose. Medicines labelled with the terms below are slow-release formulations or have special coatings and should not be crushed without pharmacist advice.

**CR** Controlled release

**SR** Sustained release

**MR** Modified release

**CD** Controlled delivery

**LA** Long acting

**HBS** Hydrodynamically balanced system

**EC** Enteric coated

# High-Risk Medicines – Steroids, NSAIDs, digoxin, oral alendronate

## Steroids

If systemic steroids have been prescribed for one month or less, side effects are rarely serious. However, the following problems may arise.

### Short-term effects:

- sleep disturbance
- increased appetite
- weight gain
- psychological effects, including increased or decreased energy
- depression
- delirium
- mania, psychosis (more common in older people with a psychiatric medical history)
- peptic ulceration (especially common in those also taking anti-inflammatory medications)
- hyperglycaemia (which can exacerbate diabetes).

### Long-term effects (in addition to above):

- aseptic necrosis of the hip
- heart failure
- muscle weakness, especially of the shoulder and thigh muscles
- salt retention: oedema, raised blood pressure, weight increase and heart failure
- shakiness and tremor
- eye disease, particularly glaucoma (increased intraocular pressure) and posterior subcapsular cataracts
- headaches and raised intracranial pressure
- increased susceptibility to infections.

**Other effects:** osteoporosis (thinning of the bones) can occur, particularly in smokers, post-menopausal women, the elderly, those who are underweight or immobile, and patients with diabetes or lung problems. This occurs after the first year in 10–20% of patients treated with more than 7.5 mg prednisone daily. It is estimated that up to 50% of patients on long-term oral corticosteroids will develop bone fractures.

**Withdrawal:** There are also side effects from reducing the dose. These include tiredness, headaches, muscle and joint aches, and depression. If the person has been on > 7.5 mg for longer than four weeks, reduce slowly to reduce the effects of adrenal suppression.

**Monitoring during steroid treatment:** monitor blood pressure, body weight, blood sugar.

## NSAIDs

NSAIDs (eg, ibuprofen) and cyclo-oxygenase-2 (COX-2) selective inhibitors are not recommended for older people. COX-2 selective inhibitors are no safer than other NSAIDs. Use extreme caution if used in those who have failed safer therapies.

Absolute contraindications include:

- active peptic ulcer disease
- chronic kidney disease
- heart failure.

Relative contraindications are:

- hypertension
- *Helicobacter pylori* infection
- history of peptic ulcer disease and simultaneous use of corticosteroids or selective serotonin reuptake inhibitors (SSRIs, eg, fluoxetine, citalopram, paroxetine).

Paracetamol should be used (unless contraindicated) for initial and ongoing treatment, particularly for musculoskeletal pain.

## Digoxin

Signs of digoxin toxicity include:

- confusion
- nausea, anorexia
- visual disturbance (yellow halos)
- either tachy- or bradyarrhythmias.

Some drugs may increase plasma digoxin levels; for example:

- amiodarone, diltiazem, verapamil, antibiotics, quinidine.

Low potassium can accelerate digoxin toxicity, even when the resident is taking usual doses.

## Oral Alendronate

Give with a full glass (180–250 mL) of plain water on an empty stomach. It should be taken as soon as the resident gets out of bed in the morning and at least 30 minutes before any food, beverage or other medicines. The resident must remain upright for 30 minutes following administration.

- Can cause GI irritation and possible bleed if not taken correctly.
- Advise the prescriber if the resident has swallowing difficulties.

# High-Risk Medicines – Psychotropic medicines

## SSRIs – selective serotonin re-uptake inhibitors (eg, citalopram, fluoxetine, paroxetine)

Hyponatremia (low sodium level) can result from the use of SSRIs.

Monitor the following prior to initiation of SSRIs:

- creatinine, eGFR
- sodium and potassium levels
- lethargy and confusion.

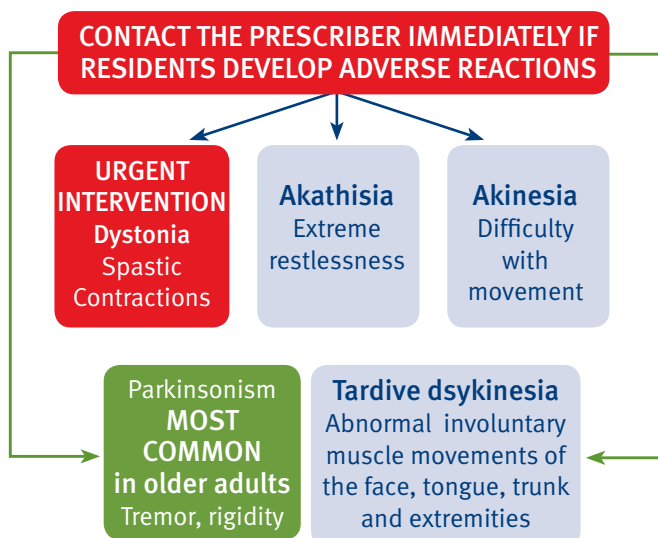
After two weeks, a follow-up sodium level should be reviewed.

Increased agitation and anxiety may also result from starting these medicines but tends to resolve after approximately one week. Contact the prescriber if this occurs.

## Antipsychotic medicines

Examples of antipsychotic medicines include risperidone, haloperidol, quetiapine.

### Common antipsychotic adverse reactions



## Lithium

This is a mood-stabilising medicine. This medicine has a narrow therapeutic index.

### Lithium toxicity can be fatal

- Serum levels should be between 0.6 and 0.8 mmol/L.
- Lithium levels should be monitored three-monthly.
- Serum levels above 1.5 mmol/L should be reported to the prescriber.
- Adverse effects can occur even in the upper therapeutic range.
- Contraindicated for residents with severe renal impairment – eGFR < 15 mL/min.
- Monitor electrolytes and renal function with a new prescription, dose changes or signs of toxicity.
- Contact prescriber if resident displays adverse effects.
- Diarrhoea and vomiting can increase the risk of toxicity and can also be an early sign of lithium toxicity, along with drowsiness, muscular weakness and lack of co-ordination.
- Monitor creatinine, electrolytes, thyroid function, urinalysis, weight, blood pressure and pulse at least 6- to 12-monthly and when health status changes.
- Older adults are much more susceptible to adverse reactions and may need a lower dose than younger people. Adverse effects can occur even in the upper therapeutic range.
- Monitor hydration, as dehydration, particularly in hot weather, can increase the risk of toxicity.
- These medicines can also interact with: SSRIs (eg, fluoxetine), NSAIDs, ACE inhibitors (eg, enalapril), and diuretics.

## High-Risk Medicines – Psychotropic medicines (Continued)

### Anticonvulsants

#### PHENYTOIN

- Therapeutic blood levels are 40–80 µmol/L.
- A small change in dose can have a large increase in effect.

Toxic blood levels > 80 µmol/L can occur at normal dosages because of a variety of factors, including:

- impaired liver function
- medicine interactions (eg, alcohol, benzodiazepines, allopurinol, sodium valproate, and many others).

#### Toxic symptoms include:

- ataxia (impaired gait)
- tremor
- slurred speech
- nausea and vomiting
- impaired cognitive function.

#### CARBAMAZEPINE

- Carbamazepine is poorly tolerated in older people – causes sedation.
- A serious side effect is agranulocytosis.
- Monitor full blood count at baseline and regularly while on this medicine.
- Report signs of infection or increased bleeding.
- Interacts with many other medicines.
- Increases lithium toxicity.
- Antibiotics and antifungal medicines can increase carbamazepine levels.
- Carbamazepine can decrease phenytoin levels.

The right dose is the dose that controls the resident's symptoms. There is no need for dose adjustment if the resident is symptom-free, even if the level is 'low'.

# Warfarin

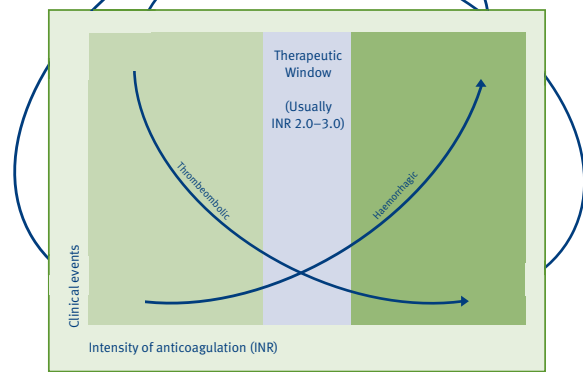
INR testing is used to keep warfarin within safe and therapeutic levels.

INR routine screening is determined by the prescriber.

Check INR soon after starting new medicines.



Many other drugs interact with warfarin!  
Always check the INR after changing or starting new medicines.



## Examples of medicine interactions with warfarin

### Enhanced anticoagulation/bleeding

- Tramadol
- Alcohol
- Allopurinol
- Paracetamol
- Amiodarone
- NSAIDs
- SSRIs  
(fluoxetine, citalopram)
- Flu vaccine
- Levothyroxine
- Statins  
(simvastatin, atorvastatin)
- Anti-Platelet Agents
- Some Antibiotics (most likely to enhance effect)
- Anti-seizure  
(phenytoin)
- Antifungals
- Herbal OTCs:  
ginseng, ginko biloba,  
St John's Wort,  
glucosamine

### Foods high in Vit K that can reduce the effect of warfarin

Broccoli	1 cup
Silverbeet	1 cup
Spinach, raw and boiled	1 cup
Parsley, raw	1/2 cup

### Foods that interact with warfarin and can increase INR and bleeding

Possibly cranberry juice and tablets (conflicting evidence)

### INR 5–8 without bleeding

Stop warfarin – contact prescriber.  
Possible recommendations for prescriber:

- Test INR daily until stable.
- Restart reduced dose with INR<5.
- Give vitamin K 0.5–1 mg oral/sc if INR fails to fall or if there is a high risk of serious bleeding.

### INR >8 with minor bleeding

Stop warfarin – contact prescriber.  
Possible recommendations for prescriber:

- Do all of the above.
- Give vitamin K 1–2 mg oral/sc if INR fails to fall or if there is a high risk of serious bleeding.

### High INR and major bleeding

Stop warfarin – contact prescriber **immediately**.  
Transfer to hospital.

- ### Warfarin: Be Alert and Reassess
- Unusual pain, swelling or bruising
  - Red or black faeces
  - Vomiting or coughing up blood
  - Dizziness, trouble breathing or chest pain
  - Falls
  - Brown or dark red urine
  - Dark, purplish or mottled fingers or toes
  - Prolonged bleeding from gums or nose
  - Unusual weakness

# Diabetes Medicines – Tablets

## Metformin

### Description

- These tablets are useful in the treatment of overweight people with type 2 diabetes.
- They should be taken with or immediately after food.
- Metformin prevents the release of too much glucose into the blood from the body's store of glucose held in the liver.
- It is weight neutral, which means weight gain is less likely. (Gaining weight increases resistance to the action of insulin).
- Metformin does not cause blood glucose levels to drop too low (hypoglycaemia) when used alone.

### Possible side effects

- Metformin is generally well tolerated, but in some people these tablets may cause diarrhoea or an upset stomach (indigestion).
- Starting with a low dose and building up gradually reduces these effects. If these symptoms persist, tell the doctor as a change of tablet may be required.
- If the person is unwell, not eating, vomiting or has diarrhoea, it may be wise to stop metformin temporarily until the person is well and eating again, but check with the prescriber first.
- Metformin should not be used in people with significant kidney failure or severe heart disease.
- Metformin should be used with caution in those aged over 75 because kidney impairment is common in this age group.

## Sulphonylureas

Tablets in this group include:

- Glipizide
- Gliclazide
- Glibenclamide

### Description

- These tablets work by stimulating the pancreas to make more insulin and help the body cells to use the insulin.
- These tablets should be taken with or just before a meal.
- Because these tablets stimulate insulin production, they can cause low blood glucose levels (hypoglycaemia).
- Glibenclamide has a longer action time in the body and is NOT recommended for use in older patients who could have some renal impairment because of the risk of severe hypoglycaemia.

## Diabetes Medicines – Tablets (Continued)

### Glitazones

#### Description

Glitazones help to lower blood glucose levels by decreasing resistance to insulin. These tablets are taken once or twice a day and can be taken with or without food.

#### Notes:

- Use with caution in the elderly. There has been increasing concern that the glitazones increase the risk of heart attacks and strokes, and also increase the risk of osteoporosis and the likelihood of fractures.
- They should not be used in people with heart failure.

### Alpha glucosidase inhibitors

#### Description

- Acarbose delays the breakdown and absorption of carbohydrate from the stomach. This reduces the rise in blood glucose levels after a meal is eaten.
- These tablets should be taken with the first bite of each meal.
- These tablets do **NOT** cause hypoglycaemia.

#### Possible side effects

- wind
- bloating
- diarrhoea.

# Diabetes Medicines – Insulin

**Very Short Acting**  
**Humalog or Novorapid**  
 Should be given immediately before meals as prescribed or as required/prescribed for hyperglycaemia.

Peak → 1–3 hours → Duration → 3–5 hours → Action Profile

• Profile of very short-acting insulin (eg, Humalog or Novorapid)

**Short Acting**  
**Actrapid/Humulin R**  
 Should be given about 20–30 minutes before a meal.

Peak → 2–4 hours → Duration → 6–8 hours → Action Profile

• Profile of very short-acting insulin (eg, Actrapid/Humulin R)

**Intermediate Acting**  
**Protaphane/Humulin NPH**

Peak → 4–12 hours → Duration → 18–24 hours → Action Profile

• Profile of intermediate-acting insulin (eg, Protaphane, Monotard, Humulin N or Humulin L)

**Peak-less Intermediate Acting**

- Lantus
- Levemir

No pronounced peak → Duration → 24+ hours → Action Profile

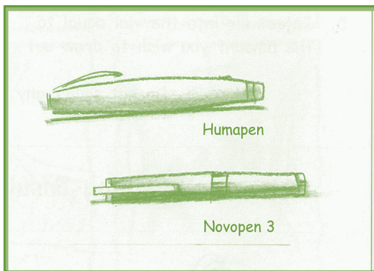
• Flat, peak-less profile of new intermediate-acting insulin

**Pre-Mixed Insulins**

- Penmix 30** = Mixtard 30 (30% Actrapid and 70% NPH)
- Penmix 40** (40% Actrapid and 60% NPH)
- Penmix 50** = Mixtard 50 (50% Actrapid and 50% NPH)
- Humalog mix 25** (25% Humalog and 75% Humulin NPH)
- Humalog mix 50** (50% Humalog and 50% Humulin NPH)

Action times vary depending on the mix

Short-acting part of pre-mix  
 Intermediate-acting part of pre-mix  
 • Profile of pre-mixed insulin



**Notes:**

Ensure resident's hands are clean prior to BSL test for an accurate result.

The pens for use with Novo brand insulin **are not** interchangeable with the pens used for Eli Lilly insulin and vice versa.

While many older people with failing eyesight find the pens much easier to use than drawing insulin from a vial with a syringe, ensure that they are able to safely change and reload the cartridge if resident self medicates.

# Diabetes Medicines – Insulin (Continued)

## USING INSULIN PENS

### 1. MIX

Cloudy insulin must be mixed by rotating pen up and down at least 20 times until the insulin is evenly mixed.

### 2. PRIME

Dial up two units, remove needle cap and with the needle pointing upwards press plunger, checking to see if insulin appears at the tip of the needle. Repeat this process until insulin DOES appear.

### 3. & 4. INJECT

Dial up the dose and inject. After pushing the plunger to deliver the insulin, count to 10 before removing the needle. Withdraw needle on same angle as injection was done to prevent bruising.

### REMEMBER

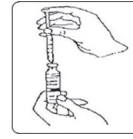
- Change needles every day.
- Rotate injection sites.
- Change insulin cartridge every four weeks even if there is still insulin in it.
- Keep insulin pen at room temperature and spare insulin in the refrigerator.

## MIXING INSULIN IN A SYRINGE

### 1.

Roll insulin vial to mix, then inject air into cloudy insulin (Intermediate acting insulin)

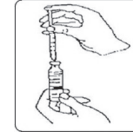
CLOUDY



### 2.

Inject air into the clear insulin (fast or short acting insulin)

CLEAR



### 3.

Draw up the clear insulin

CLEAR



### 4.

Draw up cloudy insulin

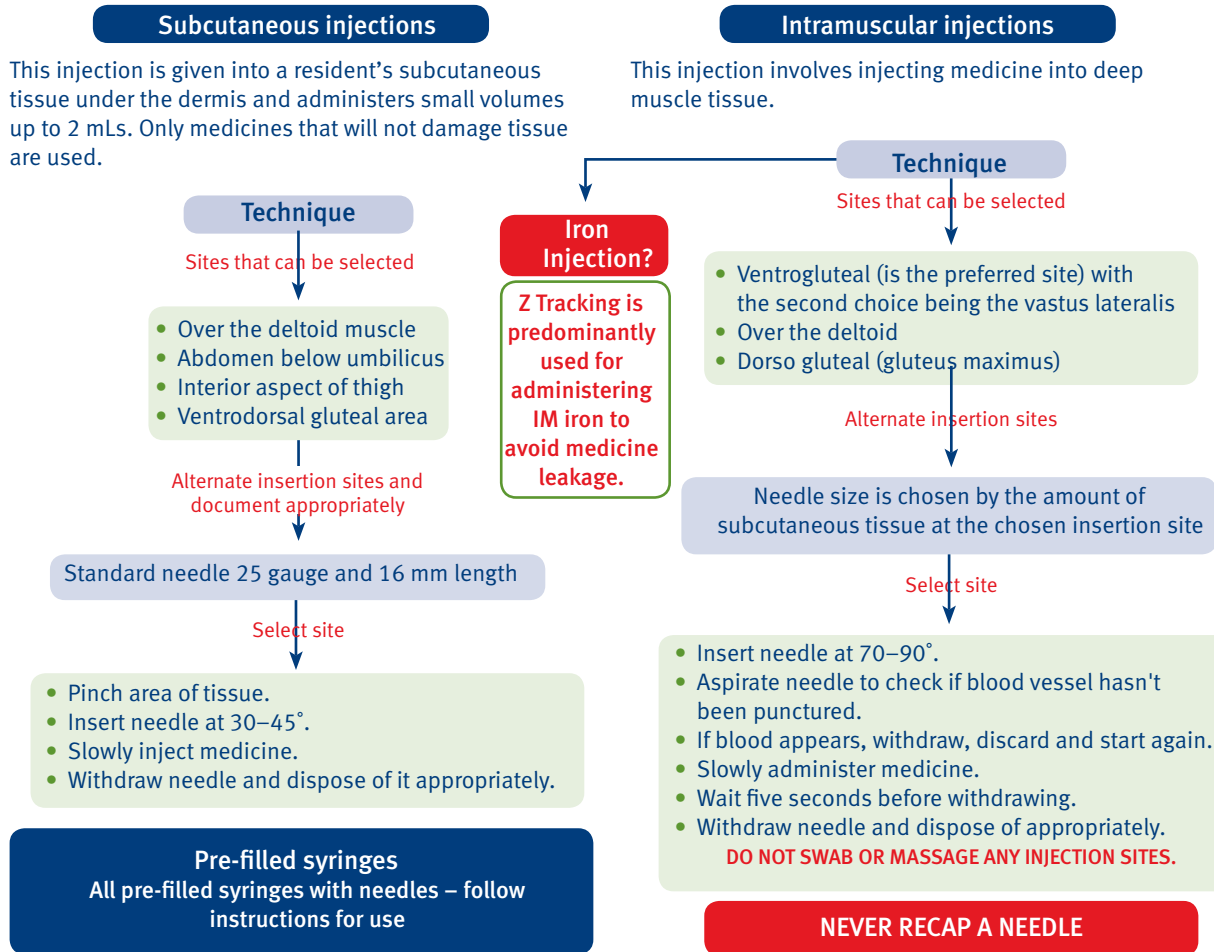
CLOUDY



### Note:

Lantus and Levemir insulin cannot be mixed with any other insulin!

# Medicines via Subcutaneous, Intramuscular and Intravenous Routes



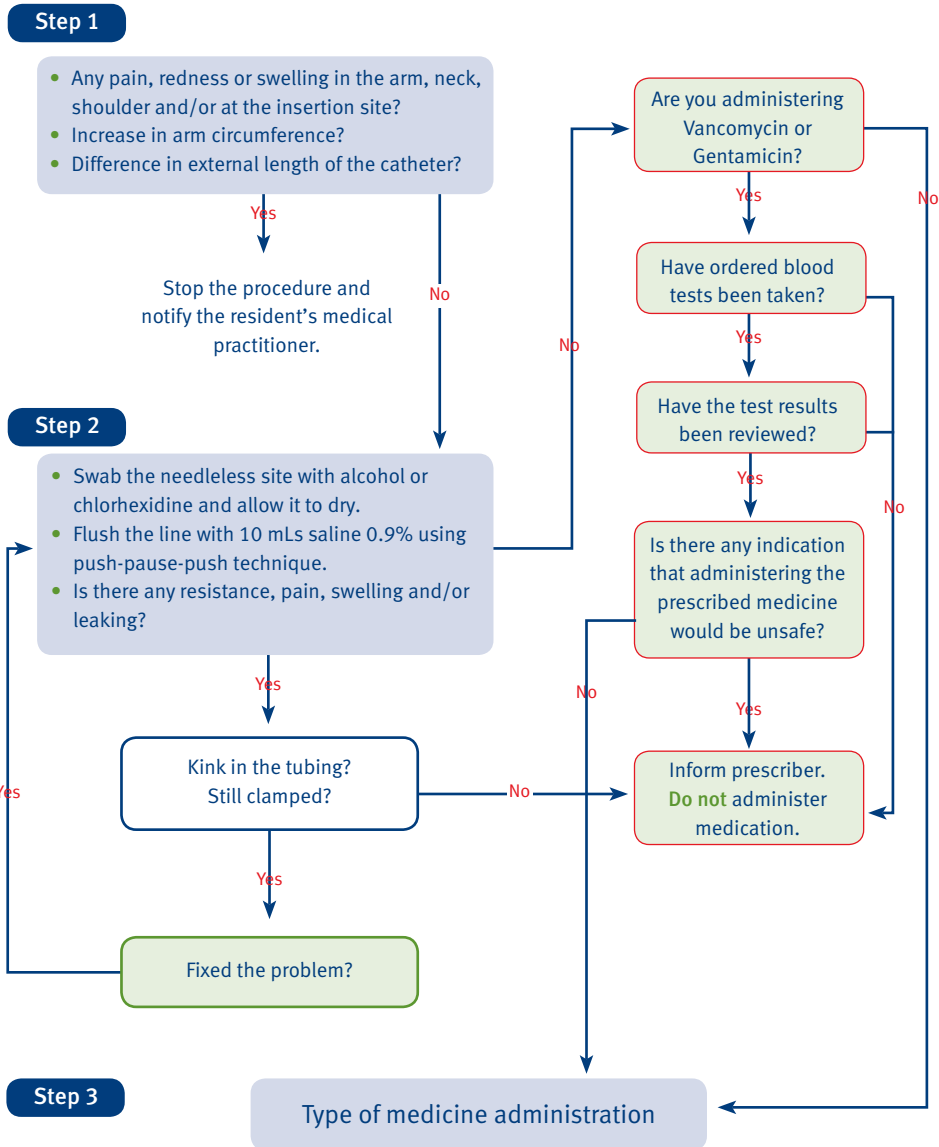
## Medicine administration via IV lines (IV-certificated nurses only)

- A IV tubing needs changing every 24 hours – document date on tubing.
- B New IV tubing and extension sets need priming.
- C The medicine label needs to be added to the bag or burette for each administration. The label covers:
  1. date
  2. time
  3. medicine
  4. dose
  5. RN and checker signatures.

## When to double-check

- Double-check if:
- you are not familiar with the medicine
  - it is a medicine that requires a drug calculation
  - it is a medicine that requires an infusion rate calculation
  - any medicine needs to be added to an infusion bag
  - you are administering insulin
  - you are administering controlled drugs
  - there are injectable medicines (eg, subcutaneous and intramuscular)
  - there are STAT doses
  - there are verbal orders.

# Medicines via Intravenous and PICC Line Routes (IV-certified nurses only)



## 24-hour infusion device (eg, Baxter infusion)

- Yes**
- Check medicine
  - Swab ports
  - Assure medicine is running through the line
  - Connect
  - Check that the line is not clamped
  - Tape the connector to skin

- PICC Checklist**
- Dressing intact
  - Line secure
  - Change dressings
  - Change luer and extension set

## Burette, Push, IV medications Medicine administration as per IV Drug Administration Handbook

- Yes**
- Check solutions/medicines**
- Stability
  - Reconstitution
  - Compatibility
  - Dilution
  - Flow rate
  - Free from precipitants
- Flush line with saline 0.9% using push-pause-push technique.
- Flush line with heparinised saline as prescribed using positive pressure technique.

# Gentamicin

## What is it?

Bactericidal aminoglycoside antibiotic

### Uses

**Bacterial infections:**  
Bone, CNS, respiratory, skin and soft tissue, urinary tract, ophthalmic, endocarditis, septicaemia, prophylaxis, endocarditis, dental, upper respiratory, gastrointestinal, genitourinary, surgery

### Contra-indications

Known hypersensitivity  
Previous gentamicin induced toxicity  
Pregnancy – category D

### Pharmacodynamics

Gentamicin inhibits protein synthesis      Narrow therapeutic index

### Pharmacokinetics

Absorption: IV-immediate IM-rapid  
Distribution varied  
Serum peak levels 30–90 minutes and can last in the circulation for 6–8 hours  
Excretion is almost entirely by renal glomerular filtration  
Serum half-life 2–3 hours

### Toxicity

Nephrotoxicity      Ototoxicity      Neurotoxicity

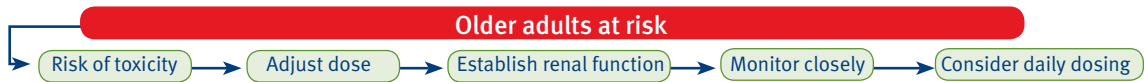
### Monitoring

Monitor drug levels (eg, peak and trough levels)  
Renal function: creatinine clearance  
Auditory: vestibular function  
Neuromuscular function  
Hydration

### Medicine interactions

Penicillins      Oto/neuro/nephro toxic agents  
Neuromuscular blockers      Opioids  
Other aminoglycosides

**Never mix IV gentamicin with any other medicine.**

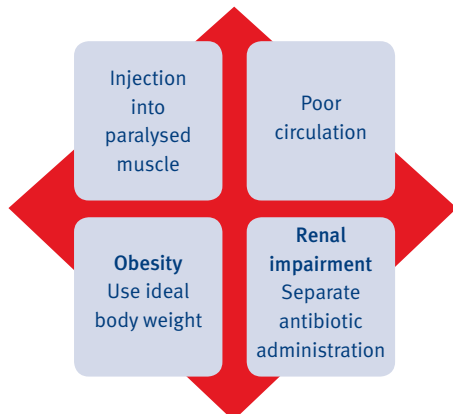


Do not withhold a dose while waiting for a serum drug level.

## Sensitivity profiles (aerobes)

GRAM +ve	GRAM -ve
MRSA <span>recommended</span>	Yersinia enterocolitica <span>recommended</span>
Listeria monocytogenes <span>recommended</span>	Francisella tularensis <span>recommended</span>
Viridians group <span>recommended</span>	Salmonella and shigella <span>variable</span>
Staphylococcus epidermidis resistant <span>recommended</span>	Pseudomonas aeruginosa <span>recommended</span>
Enterococcus sp (group D) <span>recommended</span>	

## Results may differ due to:



## What residents need to know:

**Report:**  
Dizziness  
Ringing or feeling of fullness in the ears

**Common adverse effects:**  
Nausea  
Vomiting  
Diarrhoea

# Subcutaneous Fluids, Syringe Drivers and Enteral Tubes

## Subcutaneous syringe driver (eg, NIKKI T34) (Syringe driver certificated nurses only)

Check service and calibration record

Check battery life

Subcutaneous insertion sites are chosen where there is subcutaneous fat and for resident convenience.

Possible sites:

- anterior chest wall
- anterior aspect of thighs
- anterior abdominal wall
- scapula region

Contraindicated sites:

- any area of skin or tissue abnormality
- any area receiving radiotherapy
- avoid areas with PICC lines or chemotherapy line sites

### Technique

- Subcutaneous insertion of needle (refer manufacturer's instructions).
- Check site and volume infused regularly.
- Change site and tubing every 72 hours OR sooner if insertion site is tender, reddened, painful, swollen or leaking fluid (eg, tissue).
- Check syringe, tubing and site for occlusion regularly to ensure patency.

For non-prefilled syringes:

- check compatibility
- check medicines with another staff member
- follow recommended syringe driver protocol when filling and administering medicines.

## Percutaneous endoscopic gastrostomy PEG enteral/nasogastric NG

Medicine administration through a PEG or NG tubing  
Refer: <http://www.bapen.org.uk/>

Communicate with pharmacist and dietician if medicines need to be administered through a PEG tube or NG tube especially

- SR = sustained release
- MR = modified release
- CD = controlled delivery
- EC = enteric coated
- Medicine in capsules or gels
- Risperidone

### NO metamucil

- Use bolus liquid medicines in preference to tablets/capsules.
- Flush with 50 mLs water before, between and after any medicines.
- Each medicine needs to be given separately.

**If in doubt, check with pharmacist before administering.**

## Subcutaneous fluids

When giving subcutaneous fluids:

- change site and tubing every 72 hours unless signs and symptoms of infection
- administer as per prescription
- review prescription regularly.

## Circulatory overload

Can result from accidental delivery of excess fluid and/or an over-estimation of the resident's circulatory capacity.

**Prevention and early detection:**

- ensure IV fluid is administered at the prescribed rate
- ensure roller clamp above burette is closed when fluids are commenced
- assess resident's fluid balance on each shift.

**Early signs are:**

- raised blood pressure
- tachycardia
- wheeze, dyspnoea and orthopnoea
- confusion in the older adult.

**Late signs are:**

- dependent oedema
- nausea
- vomiting
- headache
- frothy pink-tinged sputum
- oliguria.

**Action to take:**

- slow or stop infusion
- contact medical practitioner
- take resident's vital signs
- document overload.

# Decision-Making and Medicines at the End of Life

## Palliative approach

A palliative approach embraces the World Health Organization definition of palliative care:

Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial, and spiritual.

(World Health Organization 2008)

It incorporates a positive and open attitude towards death and dying by all service providers working with residents and their families, and respects the wishes of residents in relation to their treatment near the end of life. This approach, by shifting from a 'cure' to a 'care' focus, is especially important in the last 6 to 12 months of life.

Active treatment for the resident's specific illness may remain important and be provided concurrently with a palliative approach. However, the primary goal is to improve the resident's level of comfort and function, and to address their psychological, spiritual, social and cultural needs.

**It is recommended for best practice and consistency across care settings that RNs working in aged-care facilities undertake the national Syringe Driver Competency Programme, available through Hospice New Zealand.**

## Palliative approach medicine review

This includes:

- reviewing medicines and discontinuing non-essential medicines
- starting medicines to improve comfort (eg, symptom management for pain, agitation, anxiety, nausea, vomiting, respiratory tract secretions), including anticipatory prescribing of palliative medicines
- reviewing administration routes (eg, subcutaneous or rectal administration when there are swallowing difficulties): do not stop medicines that enhance comfort because the patient cannot swallow (eg, pain medicine for arthritis).

## Advance care planning

An advance care planning (ACP) discussion might cover the individual's:

- concerns and wishes
- important values or personal goals of care
- understanding of their illness and prognosis
- preferences and wishes for types of care or treatment that may be beneficial in the future, and the availability of these.

## Decision-Making and Medicines at the End of Life (Continued)

It is important to remember that if a person is incompetent and has **NO** enduring power of attorney (EPOA) or welfare guardian, then Right 7(4) of the Code of Health and Disability Services Consumers' Rights will apply:

- (a) it is in the best interests of the consumer; and
- (b) reasonable steps have been taken to ascertain the views of the consumer; and
- (c) either, –
  - (i) if the consumer's views have been ascertained, and having regard to those views, the provider believes, on reasonable grounds, that the provision of the services is consistent with the informed choice the consumer would make if he or she were competent; or
  - (ii) if the consumer's views have not been ascertained, the provider takes into account the views of other suitable persons who are interested in the welfare of the consumer and available to advise.

### Advance care directives

An advance care directive contains instructions that consent to, or refuse, the future use of specified medical treatments. It becomes effective in situations where the resident no longer has the capacity to make treatment decisions.

# Emergency Medicines and Equipment

## Aged care hospital only

Make sure the oxygen cylinders are full and checked on a regular basis.

All emergency trolleys should have a stethoscope and sphygmomanometer.

Pulse oximeter, portable suction devices (with spare suction nozzle), ambubag, masks, and IV equipment are strongly recommended.

## Other equipment to consider

Alcohol swabs    Gauze squares    Tape    Syringes

Gloves    Scissors    Saline    Needles

Sterile water    Airways

## Common medicines to consider

Adrenalin for anaphylaxis

Glucagon kit and glucose sources for hypoglycaemia (with instructions)

PR benzodiazepine (diazepam) to treat life-threatening seizures

Sublingual/spray glyceryl trinitrate (Nitrolingual) for chest pain

IV furosemide

Salbutamol inhaler (with spacer and nebulas)

**Note: Emergency medicines must be prescribed and only administered by staff working within their scope of practice who have demonstrated competency in specific medicine administration.**

Always ensure that the emergency kit is organised and equipped with all the resources needed to handle an emergency situation in your facility.

Develop a checklist, perform audits, check expiry dates and test equipment routinely.

Orient staff, keep records of these activities.

Store emergency equipment in a safe but easily accessible place.

Store CPR masks/shields in accessible places as per facility policy.

Provide an annual review and staff in-service education on the proper use of emergency equipment. Stage mock-emergency drills periodically.

**The facility GP should approve emergency stores.**

**Rest home level care**  
**In the event of a medical emergency, call 111**  
**This may include:**  
**Collapse**  
**Loss of consciousness**  
**Serious injury**  
**Serious bleeding.**

# PRN Medicines, Standing Orders and Immunisations

## PRN medicines

Prescriber orders for all PRN (as needed) medicines must have:

1. specific target symptoms
2. instruction(s) for the PRN medicine use
3. an indication of the frequency and dose range
4. the rationale for using the PRN medicine.

### **Nursing staff may administer PRN medicines only according to the prescription**

- Evidence suggests that residents who cannot communicate well are offered fewer PRN medicines.
- When giving PRN medicines, record whether it had the desired effect.
- Chronic pain requires a regularly charted analgesic.
- If PRN medicines are required on a regular basis, review the prescription and consider prescribing regularly or changing the medicine and prescribing regularly.

### **Common PRN medicines include:**

- laxatives
- pain medicine, such as paracetamol
- glyceryl trinitrate (GTN) spray for angina (chest pain)
- short-acting inhaled bronchodilators (eg, ipratropium, salbutamol).

### **High-risk PRN medicines require:**

- a well-documented rationale for their use
- vigilant monitoring for effectiveness and side effects.

### **Use non-pharmacological interventions where possible for:**

- anti-psychotic medicines
- anti-anxiety medicines
- sedative medicines
- opioids.

## PRN Medicines, Standing Orders and Immunisations (Continued)

### Standing orders

Refer: *Guidelines for the Development and Operation of Standing Orders* (Ministry of Health 2002, revised 2006).

A standing order is a written instruction issued by a medical practitioner or dentist, in accordance with the regulations, authorising any specified class of persons engaged in the delivery of health services to supply and administer any specified class or description of prescription medicines or controlled drugs to any specified class of persons, in circumstances specified in the instruction, without a prescription. A standing order does not enable a person who is not a medical practitioner or dentist to prescribe medicines – only to supply and/or administer prescription medicines and some controlled drugs.

### Immunisations

- Influenza and pneumococcal vaccines are proven to reduce death and hospitalisation among aged care residents.

#### Influenza vaccine annually

- It is recommended that staff receive annual influenza vaccinations because this also decreases resident hospitalisation and mortality.

#### Pneumococcal vaccine every 3–5 years, especially for residents with:

- chronic renal (kidney), lung, heart or liver disease and/or diabetes mellitus.

**Immunisations can be administered by** a registered nurse when a medical practitioner is onsite, a medical practitioner or a certified vaccinator.

#### Debunking immunisation myths!

- The influenza vaccine does not cause the flu.
- The risks related to illness caused by influenza are greater than the risks of taking the flu vaccine.
- Even though staff members may have ‘never had the flu’, the residents will benefit from staff vaccination, which prevents staff passing it on as carriers to residents.

# References and Resources

## Introduction

Associate Minister of Health, Minister of Health. 2010. *Actioning Medicines New Zealand 2010*.

URL: <http://www.moh.govt.nz/moh.nsf/indexmh/actioning-medicines-nz>

Health and Disability Sector Standards 2008, NZS 8134:2008.

Waitemata District Health Board. 2008. *RN Care Guides*. URL: <https://www.WDHB-agedcare.co.nz>

## Medicines Management

Health and Disability Sector Standards 2008, NZS 8134:2008.

Ministry of Health. 1997. *Safe Management of Medicines: A guide for managers of old people's homes and residential care facilities*. Wellington: Ministry of Health.

## Medicines Administration Competency

Health and Disability Commissioner. Code of Health and Disability Services Consumers' Rights 2004.

URL: <http://www.hdc.org.nz/media/24833/brochure-code-white.pdf>

Health and Disability Sector Standards 2008, NZS 8134:2008.

Health Practitioners Competence Assurance Act 2003.

Medicines Act 1981.

Medicines (Designated Prescriber: Nurse Practitioners) Regulations 2005.

Medicines Regulations 1984.

Nursing Council of New Zealand. *Registered Scopes of Practice*. URL: <http://www.nursingcouncil.org.nz>

## Medicines Administration Safety

Barclay L. 2010. *Interruptions Linked to Medication Errors by Nurses*.

URL: <http://www.medscape.com/viewarticle/720803>

Burgess M. 2002. *A Guide to the Law for Nurses and Midwives*. Auckland: Pearson Education NZ Ltd.

Cohen MR. 2002. *Medication Errors: Causes, prevention and risk management*. Boston, MA: Jones and Bartlett Publishers.

Conrad C, Fields W, McNamara T, et al. 2010. Medication room madness: calming the chaos. *Journal of Nursing* 25(2): 137–44.

Health and Disability Commissioner. *Code of Health and Disability Services Consumers' Rights 2004*.

<http://www.hdc.org.nz/media/24833/brochure-code-white.pdf>

Kazmierow M. 2007. *The Family Files: Protecting the vulnerable – EPAs reframed*.

URL: <http://www.nzlawyermagazine.co.nz/Archives/Issue73/F1/tabid/541/Default.aspx> Accessed 2 June 2010.

Mental Health (Compulsory Assessment and Treatment) Act 1992.

New Zealand Bill of Rights Act 1990.

North West Melbourne Division of General Practice. 2006. *GP and Residential Aged Care Kit*. Melbourne, Vic: North West Melbourne Division of General Practice.

NQIP. 2009. Safe Medication Management Programme. URL: <http://www.safemedication.org.nz/>

Pacala JT. 2009. *Prevention of Iatrogenic Complications in the Elderly*.

URL: <http://www.merckmanuals.com/professional/sec23/ch342/ch342e.html> Accessed 1 June 2010.

Reid-Searl K, Dwyer T, Ryan J, et al. 2006. *Student Nurse Survival Guide*. Sydney, New South Wales: Pearson Education Australia.

Tweedle F. 2009. Covert medication in older adults. *British Journal of Nursing* 18(15): 936–9.

Waitemata District Health Board. 2006. *Finding Your Way Through the Medication Administration Test*. Auckland: Waitemata District Health Board.

Whitehead N. 2009. *Clinical Services Manual*. Auckland: Simple Solutions Consultancy Ltd.

### Documentation, Incident Reporting and Quality Activities

Cohen MR. 2002. *Medication Errors: Causes, prevention and risk management*. Boston, MA: Jones and Bartlett Publishers.

Health and Disability Services Standards 2008, NZS 8134:2008.

Health and Safety in Employment Amendment Act 2004.

Health Records Standard 2002, NZS 8153:2002.

Masspro. 2007. *A Systems Approach to Quality Improvement in Long-Term Care: Safe medication practices workbook*. Boston, MA: Department of Public Health.

New Zealand Nurses Organisation. 2007. *Guidelines for Nurses on the Administration of Medicines*. New Zealand Nurses Organisation, Wellington, New Zealand.

North West Melbourne Division of General Practice. 2006. *GP and Residential Aged Care Kit*. Melbourne, Vic: North West Melbourne Division of General Practice.

Nursing Council of New Zealand. 2009. *Code of Conduct for Nurses*. Wellington: Nursing Council of New Zealand.

Whitehead N. 2009. *Clinical Services Manual*. Auckland: Simple Solutions Consultancy Ltd.

### Adverse Medicine Reactions

BPACnz. 2008. Principles of prescribing for elderly people. *Best Practice Journal*. Issue 11.

URL: <http://www.bpac.org.nz/magazine/2008/february/prescribing.asp>

Center for Adverse Reactions Monitoring (CARM). 2010. *Guide to Adverse Reporting*.

URL: <https://nzphvc-01.otago.ac.nz/carm-adr/guide.php>

Gurwitz JH, Field TS, Harrold LR, et al. 2003. Incidence & preventability of adverse drug events in the ambulatory setting. *Journal of the American Medical Association* 289: 1107–16.

### Controlled Drugs

Medsafe. 1997. Custody and storage of medicines. In: *Safe Management of Medicines: A guide for managers of old people's homes and residential care facilities*. Wellington: Ministry of Health.

URL: <http://www.medsafe.govt.nz/regulatory/guideline/safeman.asp#Custody>

Misuse of Drugs Act 1975.

Misuse of Drugs Regulations 1977.

North West Melbourne Division of General Practice. 2006. *GP and Residential Aged Care Kit*. Melbourne, Vic: North West Melbourne Division of General Practice.

West Coast District Health Board. 2009. *Administration & Management of Controlled Drugs Procedure*.

URL: [http://www.westcoastdhb.org.nz/publications/policies\\_n\\_procedures/policies\\_n\\_procedures\\_docs/medication/Controlled%20Drugs%20\(Kynnersley%20Home\)%20-%20Administration%20of%20Procedure.pdf](http://www.westcoastdhb.org.nz/publications/policies_n_procedures/policies_n_procedures_docs/medication/Controlled%20Drugs%20(Kynnersley%20Home)%20-%20Administration%20of%20Procedure.pdf)

Whitehead N. 2009. *Clinical Services Manual*. Auckland: Simple Solutions Consultancy Ltd.

### Medicines Reconciliation

Cornish PL, Knowles SR, Marchesano R, et al. 2005. Unintended medication discrepancies at the time of hospital admission. *Archives of Internal Medicine* 165(4): 424–9.

Health and Disability Services Standard 2008, NZS 8134 0:2008.

Waitemata District Health Board. 2010. *Medicines Reconciliation E-template*. Auckland: Waitemata District Health Board.

Whitehead N. 2009. *Clinical Services Manual*. Auckland: Simple Solutions Consultancy Ltd.

### Medicines Ordering – Receiving, Storing and Returning

BPACnz. 2008. Principles of prescribing for elderly people. *Best Practice Journal* 11.

URL: <http://www.bpac.org.nz/magazine/2008/february/prescribing.asp>

Medsafe. 1997. *Safe Management of Medicines: A guide for managers of old people's homes and residential care facilities*. Wellington: Ministry of Health. URL: <http://www.medsafe.govt.nz/regulatory/Guideline/safeman.asp>

Misuse of Drugs Act 1975.

Misuse of Drugs Regulations 1977.

North West Melbourne Division of General Practice. 2006. *GP and Residential Aged Care Kit*. Melbourne, Vic: North West Melbourne Division of General Practice.

Whitehead N. 2009. *Clinical Services Manual*. Auckland: Simple Solutions Consultancy Ltd.

### Cytotoxic Medicines

Occupational Safety and Health Service. 1997. *Guidelines for the Safe Handling of Cytotoxic Drugs and Related Waste*. Wellington: Department of Labour.

Pharmacy Guild of Australia. 2009. *List of Cytotoxic Drugs*. URL: [http://www.guild.org.au/uploadedfiles/Quality\\_Care\\_Pharmacy\\_Program/Standards/List%20of%20Cytotoxic%20Medicines%20-%20web%20version.pdf](http://www.guild.org.au/uploadedfiles/Quality_Care_Pharmacy_Program/Standards/List%20of%20Cytotoxic%20Medicines%20-%20web%20version.pdf)

Workplace Health and Safety, Queensland. 2005. *Guide to Handling Cytotoxic Drugs and Related Wastes*. Brisbane, Qld: Queensland Government.

### Residents Self-Medicating

Medsafe. 1997. *Safe Management of Medicines: A guide for managers of old people's homes and residential care facilities*. Wellington: Ministry of Health. URL: <http://www.medsafe.govt.nz/regulatory/Guideline/safeman.asp>

North West Melbourne Division of General Practice. 2006. *GP and Residential Aged Care Kit*. Melbourne, Vic: North West Melbourne Division of General Practice.

### Medicines Review

BPACnz. 2008a. Dilemmas in prescribing for elderly people: why is it difficult? *Best Practice Journal* 11: 6–13. URL: <http://www.bpac.org.nz/magazine/2008/february/why.asp>

BPACnz. 2008b. Principles of prescribing for the elderly. *Best Practice Journal* 11. URL: <http://www.bpac.org.nz/magazine/2008/february/prescribing.asp>

BPACnz. 2010. A practical guide to stopping medicines in older people. *Best Practice Journal* 27: 11–23. URL: <http://www.bpac.org.nz/magazine/2010/april/stopGuide.asp>

Clarke R, Ross S, Walker T, et al. 2006. Polypharmacy. *Best Practice Journal*. URL: [http://www.bpac.org.nz/resources/campaign/polypharmacy/polypharm\\_poem.asp](http://www.bpac.org.nz/resources/campaign/polypharmacy/polypharm_poem.asp)

Clayton-Smith B, Maniapoto N. 2008. Exploring the everyday experiences of older Māori and their medication. *Best Practice Journal* 11: 40–1. URL: [http://www.bpac.org.nz/Public/admin.asp?type=category&cat=maori\\_health&page=5](http://www.bpac.org.nz/Public/admin.asp?type=category&cat=maori_health&page=5)

De Smet P, Denneboom W, Karamers C, et al. 2007. A composite screening tool for medication reviews of outpatients: general issues with specific examples. *Drugs Aging* 24(9): 733–60.

Waitemata District Health Board. 2009. *Medicine Management and Administration*. Auckland: Waitemata District Health Board.

### STOPP Criteria

Gallagher P, O'Mahoney D. 2008. STOPP (Screening Tool of Older Persons' Potentially Inappropriate Prescriptions): application to acutely ill elderly patients and comparison with Beers' criteria. *Age and Ageing* 37(6): 673–9.

O'Mahony D, Gallagher P, Ryan C, et al. 2010. STOPP & START criteria: a new approach to detecting potentially inappropriate prescribing in old age. *European Geriatric Medicine* 1: 45–51.

### Strategies to Reduce the Use of Antipsychotic Medicines

Royal Australian and New Zealand College of Psychiatrists. 2008. *The Use of Antipsychotics in Residential Aged Care: Clinical recommendations developed by the RANZCP Faculty of Psychiatry of Old Age (New Zealand)*. URL: [http://www.bpac.org.nz/a4d/resources/docs/RANZCP\\_Clinical\\_recommendations.pdf](http://www.bpac.org.nz/a4d/resources/docs/RANZCP_Clinical_recommendations.pdf)

Todd M. 2010. *Antipsychotic Use*. Bupa NZ. URL: [http://www.bupa.co.nz/userDocuments/Antipsychotic\\_apr19\\_2010.pdf](http://www.bupa.co.nz/userDocuments/Antipsychotic_apr19_2010.pdf)

### Medicines Effect Monitoring

Australian Pharmaceutical Advisory Council. 2002. *Guidelines for Medication Management in Residential Aged Care Facilities (3rd edition)*. Australian Government Department of Health Ageing. URL: <http://www.health.gov.au/internet/main/publishing.nsf/Content/nmp-pdf-resguide-cnt.htm>

BPACnz. 2010. *When is Enough, Enough?: Stopping medicines in older people*.

URL: [http://www.bpac.org.nz/magazine/2010/april/docs/bpj\\_27\\_stopping\\_pages\\_6-9\\_pf.pdf](http://www.bpac.org.nz/magazine/2010/april/docs/bpj_27_stopping_pages_6-9_pf.pdf)

North West Melbourne Division of General Practice. 2010. *General Practice in Residential Aged Care*.

URL: [http://www.impetus.org.au/after\\_hours/index.html](http://www.impetus.org.au/after_hours/index.html)

### High-Risk Medicines

**Digoxin:** New Zealand Guidelines Group. *New Zealand Cardiovascular Guidelines Handbook: A summary resource for primary care practitioners (2nd edition)*. Wellington: New Zealand Guidelines Group.

Springhouse. 2003. *Australian/New Zealand Nursing Drug Handbook*. Sydney, NSW: Lippincott Williams & Wilkins.

**NSAIDs:** American Geriatrics Society. 2009. AGS Panel on Pharmacological Management of Persistent Pain in Older Persons. *Journal of the American Geriatric Society* 57(8): 1331–46.

**Oral Alendronate:** Springhouse. 2003. *Australian/New Zealand Nursing Drug Handbook*. Sydney: Australia: Lippincott Williams & Wilkins.

**Psychotropic medicines:** BPACnz. 2007. *Lithium in General Practice*.

URL: <http://www.bpac.org.nz/magazine/2007/february/lithium.asp?>

BPACnz. 2010. *Antipsychotics in Dementia*. URL: <http://www.bpac.org.nz/a4d/resources/guide/guide.asp?page=3>

Keltner NL, Folks DG. 2001. *Psychotropic Drugs* (3rd edition). London, UK: Mosby.

Nicholson J. 2002. Monitoring patients on lithium: a good practice guideline. *Psychiatrist* 26: 348–351.

**Steroids:** New Zealand Dermatology Society Inc. 2010. *Systemic Steroids*.

URL: <http://dermnetnz.org/treatments/systemic-steroids.html> Accessed 5 October 2010.

### Warfarin

Blann AD, Fitzmaurice DA, Lip GYH. 2003. ABC of antithrombotic therapy: clinical review anticoagulation in hospitals and general practice. *BMJ* 326: 153–6.

BPACnz. 2006. *Guide for Using INR to Manage Warfarin*.

URL: [http://www.bpac.org.nz/resources/campaign/inr/bpac\\_inr\\_poem\\_2006\\_appendix.pdf](http://www.bpac.org.nz/resources/campaign/inr/bpac_inr_poem_2006_appendix.pdf) Accessed 4 October 2010.

Myers SP. 2002. Interactions between complementary medicines and warfarin. *Australian Prescriber* 25(3): 54–6.

Suvarna R, Pirmohamed M, Henderson L. 2003. Possible interaction between warfarin and cranberry juice. *BMJ* 327(7429): 1454.

Tucker ME. 2006. Drug interactions with warfarin often serious: warfarin tops the list of medications that can cause fatal drug interaction. *Internal Medicine News*. URL: [http://findarticles.com/p/articles/mi\\_hb4365/is\\_12\\_39/ai\\_n29275799](http://findarticles.com/p/articles/mi_hb4365/is_12_39/ai_n29275799)

### Diabetes Medicines

Carlton P. 2009. *Diabetes and the Older Person: A guide for caregivers*. Auckland: Waitemata DHB Diabetes Service.

New Zealand Guidelines Group. 2003. *Management of Type 2 Diabetes*. Wellington: New Zealand Guidelines Group.

### Medicines via Subcutaneous, Intramuscular and Intravenous Routes/Medicines via Intravenous and PICC Lines Routes/ Gentamicin/Subcutaneous Fluids, Syringe Drivers and Enteral Tubes

Bish T, Lazarus C, Peperkoorn M. 2009. *Gentamicin*. Poster presented at Auckland University.

Counties Manukau District Health Board. 2005. *IV Capability Aged Residential Care (ARC) Study Day: Peripheral IV cannulation and administration of IV medications*. Counties Manukau DHB, Manukau, New Zealand.

Counties Manukau District Health Board. 2008. *Some Drug Names Are Changing*. Department of Pharmacy Medicines Information Service. Counties Manukau DHB, Manukau, New Zealand.

Lehen R. 2010. *Pharmacology for Nurses* (7th edition). Philadelphia, Pa, W.B. Saunders Co.

Medsafe. 2005. *MIMS: Pharmacotherapeutics Text* (2nd Ed.). Wellington, New Zealand, Medsafe.

Medsafe. 2010. NZ Medicine and Medical Devices Safety Authority: Data sheet: *Gentamicin*.

URL: <http://www.medsafe.govt.nz/profs/datasheet/g/Gentamicininj.htm>

New Zealand Nurses Organisation. 2010. *Guidelines: Nurses initiating and administering intravenous therapy in community settings*. URL: <http://www.nzno.org.nz/LinkClick.aspx?fileticket=X7avmiLh2zQ%3Dhttp://www.nzno.org.nz/LinkClick.aspx?fileticket=X7avmiLh2zQ%3D>

Radius Medical Solutions Ltd. 2010a. *Intravenous Therapy – Workbook: Clinical manual: Intravenous fluid and drug administration workbook*. Version 1. Napier, New Zealand: Radius Medical Solutions Ltd.

Radius Medical Solutions Ltd. 2010b. *Standards of Practice for Intravenous Therapy: Clinical manual: Intravenous fluid and drug administration*. Version 1. Napier, New Zealand: Radius Medical Solutions Ltd.

Rogers J. 2010. *Home IV Antibiotics: Closing the loop*. Auckland: Waitemata DHB.

Semla TP, Beizer JL, Higbee MD. 2005. *Geriatric Dosage Handbook* (10th edition). Hudson, OH: Lexi-Comp.  
Waitemata DHB Guideline: (Intravenous and Subcutaneous Standards of Practice and Training Guidelines).  
URL: [http://intranet/QualityDocs/Quality%20Documentation/O2%20Medication%20Administration/2%20Policy/\[P\]%20Medicine%20Management%20&%20Administration%20Nov09.pdf](http://intranet/QualityDocs/Quality%20Documentation/O2%20Medication%20Administration/2%20Policy/[P]%20Medicine%20Management%20&%20Administration%20Nov09.pdf)

### Decision-Making and Medicines at the End of Life

Australian National Health and Medical Research Council. 2006. *Guidelines for a Palliative Approach to Residential Aged Care*. URL: <http://www.nhmrc.gov.au/publications/synopses/ac12to14syn.htm>

Gold Standards Framework. 2010. *Examples of Good Practice*.

URL: <http://www.goldstandardsframework.nhs.uk/Resources/Gold%20Standards%20Framework/Test%20Content/ExamplesOfGoodPracticeResourceGuideJustInCaseBoxes.pdf>

Mary Potter Hospice. 2011. *Hospice New Zealand Syringe Driver Competency Programme*, September 2009, Wellington.

URL: <http://marypotter.org.nz/SD%20Competency%20%20Update%20Flyer.pdf>

MacLeod R, Macleod A, Vella-Brinkat J. 2009. *The Palliative Care Handbook (4th edition)*. Christchurch: Nurse Maude.

NSW Health. 2005. *Guidelines for End-of-life Care and Decision-making*. NSW Department of Health.

URL: [http://www.health.nsw.gov.au/pubs/2005/pdf/end\\_of\\_life\\_care.pdf](http://www.health.nsw.gov.au/pubs/2005/pdf/end_of_life_care.pdf)

World Health Organization. 2008.

### Emergency Medicines and Equipment

Cohen ML. 2005. Is your code cart ready? *Modern Medicine*.

URL: <http://medicaleconomics.modernmedicine.com/memag/article/articleDetail.jsp?id=179082>

Radius Medical Solutions Ltd. 2010. *Emergency Trolley Policy*. Napier, New Zealand: Radius Medical Solutions Ltd.

Williams L. 2010. *Knowing When to Resuscitate in Nursing Homes*.

URL: [http://findarticles.com/p/articles/mi\\_m3830/is\\_4\\_53/ai\\_n6047741/](http://findarticles.com/p/articles/mi_m3830/is_4_53/ai_n6047741/)

### PRN Medicines, Standing Orders and Immunisations

Family Doctor. 2010. *Pneumococcal Infection and Vaccination: A patient's guide*. URL: <http://www.familydoctor.co.nz>

Gold Standards Framework: 2006. *Examples of Good Practice Resource Guide*.

URL: <http://www.goldstandardsframework.nhs.uk/Resources/Gold%20Standards%20Framework/Test%20Content/ExamplesOfGoodPracticeResourceGuideJustInCaseBoxes.pdf>

Ministry of Health. 2006. *Guidelines for the Development and Operation of Standing Orders*. URL: <http://www.moh.govt.nz/moh.nsf/ea6005dc347e7bd44c2566a40079ae6f3e4074648f6d7f03cc256c7b0080c60d?OpenDocument>

Stokes JA, Purdie DM, Roberts MS. 2004. Factors influencing PRN medication use in nursing homes. *Pharmacy World and Science* 26: 148–54.