

EMERGENCY DEPARTMENT MEDICATION SAFETY AND ADMINISTRATION PROTOCOL

Protocol 6: Safe Prescribing, Preparation, Administration, Monitoring, and Transition of Medication Care

DRAFT FOR CLINICAL, NURSING, PHARMACY, GOVERNANCE, AND PATIENT-SAFETY REVIEW

Document owner	Emergency Department / Pharmacy Services / Nursing / Clinical Governance
Policy number	ED-PRO-006
Version	Draft 1.0
Related policies	ED-PRO-001: ED Patient Journey; ED-PRO-002: Triage and Retriage; ED-PRO-003: Resuscitation and Initial Stabilization; ED-PRO-004: Clinical Assessment and Documentation; ED-PRO-005: Investigations, Critical Results, and Results Tracking
Effective date	[To be inserted after approval]
Review date	[12 months after implementation, then every 2-3 years or sooner after major formulary, legal, regulatory, technology, or service change]
Approved by	[Medical Executive / Nursing Executive / Pharmacy Lead / Medication Safety Committee / Clinical Governance / Hospital Board]
Applies to	All staff who prescribe, transcribe, verify, procure, store, prepare, dispense, administer, monitor, reconcile, communicate, document, or audit medication use in the Emergency Department
Supersedes	[Insert previous medication-management or administration policy, if applicable]

Important: This protocol establishes the medication-safety system for the Emergency Department. It does not replace the approved formulary, adult and paediatric dosing references, resuscitation algorithms, antimicrobial guidelines, controlled-drug policy, blood-product policy, procedural-sedation policy, pharmacy procedures, or manufacturer instructions. Exact doses, concentrations, infusion rates, reversal regimens, and monitoring parameters must come from current locally approved clinical references.

The medication-use loop is safe only when the right medicine reaches the right patient, for the right reason, in the right dose and form, by the right route and time, with the right monitoring, documentation, communication, and follow-up.

1. Purpose

To ensure that medication use in the Emergency Department is clinically appropriate, accurately prescribed, safely verified, prepared, administered, monitored, reconciled, communicated, and documented. The protocol aims to reduce wrong-patient and wrong-drug events, dosing and calculation errors, allergy-related harm, omitted or duplicated therapy, unsafe high-alert medication use, infusion errors, adverse drug events, medication discrepancies at transitions, and failures to educate patients or receiving teams.

2. Scope

This protocol applies from the first medication history and treatment decision until medication responsibility is safely transferred at discharge, admission, procedure, interfacility transfer, or death. It covers prescription and non-prescription medicines, traditional and complementary products, vaccines, contrast agents, antidotes, emergency medicines, patient-owned medicines, controlled medicines, infusion fluids containing medicines or electrolytes, investigational or restricted products when locally authorized, and medications supplied during shortages or downtime.

3. Core policy statements

- Every medication shall have a documented indication, an authorized prescriber, an unambiguous order, and a monitoring or reassessment plan proportionate to risk.
- At least two approved patient identifiers shall be used before prescribing, preparing, dispensing, or administering medication whenever possible. Bed, room, or trolley number is not an identifier.
- Allergy and prior adverse-reaction status shall be sought, documented, displayed, and checked before medication administration. “No known allergy” must reflect an active inquiry rather than an empty field.
- Prescribers and administrators shall use current locally approved dosing references, including weight-based and renal/hepatic adjustment resources where relevant.
- Medication orders shall be complete and legible, using generic names where practicable, metric units, leading zeros for doses below one unit, no trailing zeros, and no prohibited abbreviations or ambiguous symbols.
- High-alert medications require defined safeguards based on the local risk assessment, including standardization, access control, concentration limits, labelling, monitoring, and independent checks where these add safety.
- Emergency urgency may justify abbreviated processes, but never abandonment of patient identification, allergy review when obtainable, dose verification, labelling, monitoring, and retrospective documentation.
- No medication may remain in an unlabelled syringe, cup, basin, infusion bag, or other container once it leaves the preparer’s hand or immediate uninterrupted control.
- The person administering a medicine is responsible for completing the final bedside verification and may stop the process when the order, product, patient, dose, route, timing, or monitoring appears unsafe.
- Medication reconciliation is required at admission, transfer, and discharge and shall address omissions, duplications, interactions, contraindications, intended continuations, and intentional changes.
- Patients and caregivers shall receive medication information in a form they can understand, including purpose, dose, timing, duration, important precautions, and what has changed.
- Medication incidents, near misses, adverse drug reactions, shortages, and unsafe system conditions shall be reported and reviewed without punitive concealment, while maintaining professional accountability.

4. Definitions

Term	Operational definition
Adverse drug event	Patient harm associated with the use of a medication, whether preventable or non-preventable.

Term	Operational definition
Adverse drug reaction	A harmful and unintended response to a medicine used at normal doses, distinct from an administration or prescribing error.
Medication error	A preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is under the control of a health professional, patient, or system.
Near miss	A medication error detected and corrected before it reaches the patient or before harm occurs.
High-alert medication	A medication with a heightened risk of causing serious patient harm when used in error; the term describes severity of consequence, not necessarily frequency of error.
Independent double-check	A second qualified person separately verifies selected critical components without being led through the first person's calculation or conclusion.
Medication reconciliation	A structured comparison of the best available list of medicines a patient is taking or should be taking with newly ordered medicines, resolving unintended discrepancies at transitions of care.
Best possible medication history	The most accurate medication list reasonably obtainable through patient/caregiver interview and verification from one or more reliable sources.
LASA medicine	A look-alike or sound-alike medicine that may be confused because of similar names, packaging, labelling, appearance, strength, or storage location.
Stat order	A medication order requiring immediate priority according to the hospital's locally approved timeframe.
Verbal / telephone order	An order communicated orally when the authorized prescriber cannot enter or write the order directly and delay would be unsafe or impracticable.
Medication omission	Failure to prescribe or administer a dose that is clinically intended and due, excluding a documented and clinically justified withholding decision.
Extravasation	Unintended leakage of a vesicant or irritant medicine from a vessel into surrounding tissue.
Antidote / reversal agent	A medicine used to counteract or reduce the toxic or pharmacological effect of another substance or medicine.
Medication-use loop	Selection, procurement, storage, prescribing, verification, preparation, dispensing, administration, monitoring, reconciliation, communication, and review.

5. Roles and accountability

Role	Minimum accountability
ED medical lead	Owns ED medication governance; approves clinical pathways and emergency standing orders; coordinates audit, review, and corrective action.
Responsible prescriber	Confirms indication, patient factors, allergies, interactions, dose, route, timing, monitoring, and intended duration; writes a complete order; reviews response and adverse effects.
ED nurse	Obtains and documents medication information within scope; completes bedside checks; prepares and administers safely; monitors effect; records administration; escalates omissions, reactions, discrepancies, and unsafe conditions.
Pharmacist / pharmacy service	Supports formulary selection, medication history and reconciliation, order review, dispensing, high-alert safeguards, stock control, shortage management, education, incident review, and medication information.
Medication preparer / dispenser	Selects the correct product and strength; confirms expiry and integrity; calculates and labels accurately; follows aseptic and storage requirements; documents supply.
Receiving clinician / ward team	Explicitly accepts medication responsibility at transfer; reconciles ongoing, withheld, newly started, and time-critical medicines; acts on monitoring requirements.
Patient / caregiver	Provides medication and allergy information where able; asks questions; participates in teach-back; reports unexpected symptoms and access barriers.
Medication Safety / Pharmacy and Therapeutics Committee	Approves formulary controls, high-alert and LASA lists, standard concentrations, independent-check policy, shortage substitutions, incident review, and improvement plans.
Clinical governance / quality	Monitors medication harm, near misses, omitted-dose patterns, reconciliation quality, and implementation of corrective actions.
Hospital executive	Provides adequate staffing, pharmacy support, equipment, refrigeration, secure storage, infusion technology, reference access, training, and reporting systems.

6. The Emergency Department medication-use pathway

Stage	Required safety action
1. Know the patient	Confirm identity, age, weight where relevant, allergies, pregnancy possibility, comorbidities, organ function, current medicines, and previous reactions.
2. Define the treatment goal	State the indication, urgency, intended clinical effect, and important alternatives or contraindications.
3. Prescribe clearly	Use a complete, unambiguous order with medicine, dose, route, frequency/timing, duration or stop condition, and monitoring.

Stage	Required safety action
4. Verify and supply	Confirm order validity, product, strength, dose, interactions, duplication, storage, expiry, and high-alert safeguards.
5. Prepare and label	Use correct technique, standardized concentration, calculations, dilution, compatibility, and immediate labelling.
6. Administer at bedside	Use two identifiers and final rights/checks; explain where feasible; maintain interruption control and infection prevention.
7. Monitor and reassess	Measure intended effect, vital signs, laboratory or ECG parameters, sedation, pain, glucose, bleeding, or other risks as indicated.
8. Document and communicate	Record administration or withholding, response, adverse effects, and any required handover or patient education.
9. Reconcile at disposition	Specify which medicines continue, stop, change, or start; resolve discrepancies; provide written instructions and follow-up.

A medicine is not “given safely” merely because it entered the patient. Safety includes the indication, verification, monitoring, response, and transition plan.

7. Medication history and reconciliation

7.1 Best possible medication history

- Obtain the history as early as clinically feasible without delaying immediate resuscitation.
- Ask about prescribed medicines, over-the-counter products, inhalers, eye/ear preparations, injections, patches, topical medicines, contraceptives, supplements, herbal or traditional products, alcohol and substance use where relevant, and medicines recently stopped or changed.
- Record medicine name, dose or strength, route, frequency, indication, last dose, duration, adherence, prescriber/pharmacy, and patient understanding when available.
- Use at least two information sources for high-risk or uncertain cases where feasible: patient/caregiver, medicine containers or photographs, pharmacy records, prior notes, primary care clinician, specialist, or national/shared medication system.
- Identify time-critical medicines whose delay may cause harm, such as insulin, anticonvulsants, antiparkinsonian medicines, corticosteroids, anticoagulants, transplant medicines, and other locally designated therapies.
- Document information gaps, reliability of sources, and medicines still requiring verification.

7.2 Reconciliation at transitions

- Compare the prior medication list with ED medicines and intended post-ED medicines.
- Resolve unintended omissions, duplications, dose changes, route changes, interactions, contraindications, and unclear stop/start decisions.
- Document each intentional change and its reason.
- At admission or transfer, hand over time-critical doses already given, due, withheld, or missed, together with monitoring requirements and last administration times.
- At discharge, provide a reconciled list showing medicines to continue, stop, change, and start, including duration and follow-up.
- Escalate unresolved discrepancies to the responsible clinician and pharmacy service where available before disposition.

8. Prescribing and order standards

- Confirm patient identity and the correct encounter before ordering.
- Record the medicine by approved generic name unless a brand is clinically required; document the brand-specific reason where relevant.
- Specify dose, dosage form, route, frequency or exact timing, indication when not obvious, and duration or review/stop point.
- For weight-based dosing, document the current measured weight in kilograms, dosing weight used, calculation, maximum dose, and source reference where required.
- For continuous infusions, specify total drug amount, diluent and final volume or concentration, route, starting rate, titration parameters, maximum rate, monitoring, and stop/weaning instructions.
- For as-needed medicines, state indication, minimum interval, maximum dose in a defined period, and relevant monitoring or hold criteria.
- For one-time, stat, loading, or procedural doses, state the intended administration time and whether repeat dosing is permitted.
- Assess allergies, pregnancy or lactation, renal and hepatic function, age, frailty, weight, interactions, duplication, contraindications, previous response, and access/adherence barriers.
- Use metric units and approved terminology. Write “units” in full. Use 0.5 mg, never .5 mg; write 5 mg, never 5.0 mg.
- Do not use unapproved abbreviations, drug-name abbreviations, naked decimal points, trailing zeros, ambiguous ranges, or symbols that can be misread.
- Electronic alerts do not replace clinical judgment. Resolve or document significant alerts rather than overriding them routinely.
- When changing an order, discontinue or clearly replace the previous order to avoid simultaneous active instructions.

9. Verification, dispensing, and supply

- Where pharmacy verification is available, clinically important and high-risk orders should be reviewed before administration unless immediate emergency treatment cannot wait.
- Verification includes identity, allergies, indication, dose, route, timing, duplication, interactions, contraindications, laboratory values, organ function, product availability, and monitoring.
- The selected product shall match the order in medicine, formulation, strength, route, and expiry; packaging integrity and storage history shall be acceptable.
- Dispense or issue the smallest practical quantity for the immediate episode when this reduces risk and waste.
- Use unit-dose, ready-to-administer, prefilled, or pharmacy-prepared products where available and appropriate, especially for high-alert medicines.
- Questions or discrepancies must be resolved with the prescriber before supply or administration unless an approved emergency protocol applies.
- Substitution during shortages shall follow a written approved protocol and be communicated to all affected staff, with attention to concentration, dose equivalence, labelling, and monitoring differences.
- Patient-specific doses prepared by pharmacy shall be labelled with patient identifiers, medicine, dose, concentration, diluent, total volume, route, preparation and expiry/beyond-use time, storage, and preparer/checker as required.

10. Preparation and labelling

- Prepare medicines in a designated, clean, adequately lit area with minimal interruption and access to current references.
- Perform hand hygiene and use aseptic non-touch technique for parenteral preparation. Disinfect access points and follow approved single-dose and multi-dose vial procedures.

- Prepare medicines for one patient at a time and keep the order or electronic medication record available throughout.
- Calculate independently before drawing up. For complex or high-alert calculations, use an approved calculation aid and the locally defined independent-check process.
- Use only approved diluents, concentrations, containers, filters, and routes. Confirm compatibility, stability, light protection, and administration time.
- Label every prepared syringe, cup, basin, bag, bottle, or line immediately unless the medicine is prepared and administered by the same person in one uninterrupted action.
- The label shall include medicine name, amount or concentration, diluent/volume where relevant, route, preparation time, expiry/beyond-use time, patient identifiers for patient-specific preparations, and preparer initials as locally required.
- Discard any unlabelled, ambiguously labelled, expired, contaminated, compromised, or unattended preparation.
- Do not pre-draw medicines for convenience unless an approved process defines preparation, labelling, storage, expiry, security, and accountability.

11. Bedside administration standard

Verification	Required bedside check
Right patient	Use at least two approved identifiers and match the medication administration record/order.
Right medicine	Compare the label with the active order and check LASA risk.
Right dose	Check strength, calculation, maximum dose, previous doses, and cumulative limits.
Right route / site	Confirm route, access device, line, site, patency, and route-specific precautions.
Right time	Check due time, last dose, interval, food/procedure relationship, and urgency.
Right indication	Confirm why the patient is receiving the medicine and that the order still fits the clinical state.
Right assessment	Check required vital signs, pain/sedation score, glucose, ECG, laboratory values, swallowing, or other prerequisites.
Right information / consent	Explain purpose and important immediate effects where feasible; respect informed refusal and assess capacity when needed.
Right documentation	Record promptly after administration, not in advance; document omission, delay, refusal, waste, or variance.
Right response	Monitor for benefit, toxicity, allergy, extravasation, oversedation, bleeding, hypoglycaemia, or other expected risks.

- Keep medication and patient under continuous control during the final check. Avoid non-urgent interruptions; restart the check if interrupted.
- If the patient, caregiver, order, label, dose, route, or clinical state raises concern, pause and clarify before administration.
- Do not leave oral medicines unattended unless an approved self-administration process exists.

- For IV push or rapid-onset medicines, confirm dilution, recommended rate, line patency, compatibility, monitoring, and immediate access to resuscitation support where indicated.
- Document the exact time of administration, route/site, dose, relevant observations, and administrator identity.

12. High-alert medications

12.1 Governance principles

- The hospital shall maintain a locally approved high-alert medication list based on international guidance, local formulary, incident data, and service profile.
- Safeguards shall focus on system design rather than relying only on staff vigilance: standard concentrations, restricted stock, separate storage, prominent auxiliary labelling, dosing limits, smart-pump libraries where available, and standardized order sets.
- Independent double-checks shall be reserved for selected high-risk steps where they are truly independent and feasible; they are not a substitute for safer product and process design.
- High-alert medication administration requires explicit monitoring and an escalation plan for toxicity or treatment failure.
- Antidotes and reversal resources required for locally used high-alert medicines shall be readily accessible, in date, and included in emergency drills.

12.2 Typical classes requiring local review

- Insulins and concentrated glucose-lowering therapies.
- Anticoagulants, thrombolytics, and other high-risk antithrombotic therapies.
- Opioids, sedatives, anaesthetic agents, and neuromuscular blocking agents.
- Vasoactive and inotropic infusions; concentrated adrenergic agents.
- Concentrated electrolytes and hypertonic solutions.
- Antiarrhythmics and other IV medicines with narrow therapeutic margins.
- Chemotherapy or other hazardous medicines if ever used in the ED.
- Oxytocin, magnesium sulfate, and other obstetric high-alert medicines where applicable.
- Paediatric and neonatal medicines requiring small-volume or weight-based preparation.

A high-alert label does not mean “never use.” It means design the process so that a single slip is less likely to reach the patient or cause catastrophic harm.

13. Independent double-checks

- The local policy shall define which medicines and which steps require an independent double-check.
- The second checker shall review the original order, patient, allergy status, medicine, indication, dose, weight and calculation, concentration, route, pump settings, timing, and monitoring as applicable.
- The second checker should perform calculations separately rather than merely confirming the first person’s result.
- Any discrepancy must be resolved before administration. Agreement between two people does not override a suspicious or clinically implausible order.
- Document the check in the approved system. Avoid “cosigning” without actual independent verification.
- When a second qualified checker is unavailable in a true emergency, proceed only under the approved emergency exception, use the safest available standardized product/reference, and document the circumstances and retrospective review.

14. Emergency, verbal, and telephone orders

- Verbal or telephone medication orders are restricted to emergencies or situations where direct order entry is not reasonably possible.
- The receiver writes or enters the complete order immediately and reads back patient identity, medicine, dose, route, timing, indication, and any titration or monitoring instruction.
- The prescriber confirms the read-back and authenticates the order within the locally approved timeframe.
- During resuscitation, one team member should record medications and times in real time; the team leader confirms high-risk or repeated doses aloud.
- When the medication is drawn up away from the bedside or passed between staff, it must be labelled and verbally verified before administration.
- Stat status does not justify ambiguous prescribing, unsafe dose escalation, or omission of monitoring.

15. Paediatric and neonatal medication safety

- Obtain and document a current measured weight in kilograms; do not rely on pounds or caregiver estimate except during an immediate emergency when no safer option exists.
- Use an approved paediatric dosing reference and calculate dose by the appropriate weight, age, body surface area, or clinical parameter. State maximum dose.
- Use length-based or other approved emergency dosing systems when weight cannot be obtained during resuscitation.
- Avoid unnecessary decimal calculations and very small volumes; use standardized paediatric concentrations, oral syringes, and appropriately sized devices.
- Require independent verification for locally designated high-risk paediatric doses, infusions, and dilutions.
- Confirm total cumulative dose when multiple clinicians or services have administered medication.
- Use paediatric-specific monitoring, equipment, antidote doses, and discharge instructions.

16. Special-population prescribing and monitoring

Population / risk	Minimum considerations
Pregnancy / lactation	Urgency, gestational age, maternal benefit, fetal/neonatal risk, breastfeeding, and safer alternatives; do not withhold life-saving treatment solely because of pregnancy.
Renal impairment	Current and trend renal function, dialysis status, loading versus maintenance dose, nephrotoxicity, accumulation, fluid/electrolyte effects, and timing of repeat tests.
Hepatic impairment	Severity, metabolism, bleeding risk, albumin/protein binding, encephalopathy, and hepatotoxicity.
Older adult / frailty	Polypharmacy, anticholinergic or sedating burden, falls, delirium, swallowing, renal function, goals of care, and deprescribing opportunities.
Obesity / very low weight	Appropriate actual, ideal, adjusted, lean, or dosing weight; dose caps; device/needle selection; concentration and infusion-rate limits.
Allergy / prior reaction	Nature, severity, timing, culprit, cross-reactivity, previous tolerance, desensitization status, and emergency alternatives.

Population / risk	Minimum considerations
Behavioural emergency / intoxication	Substance exposure, QT risk, respiratory depression, temperature, agitation cause, restraint monitoring, and cumulative sedative dose.
Polypharmacy / multimorbidity	Interactions, duplication, adherence, competing guidelines, treatment burden, access, and patient priorities.
Limited communication / capacity	Interpreter, caregiver, accessible information, supported decision-making, and documentation of consent or emergency best-interest treatment.

17. Infusions, pumps, and vascular-access safety

- Use standardized concentrations and ready-to-administer products where feasible.
- Trace every line from patient to source before connecting, changing, flushing, or administering. Label lines and lumens when multiple infusions are present.
- Confirm access type, patency, site condition, compatibility, dead-space implications, and dedicated-line requirements.
- Program the pump from the active order and verify dose units, concentration, patient weight, rate, volume to be infused, limits, and channel.
- Use the approved drug library when available and investigate rather than routinely override hard or soft limits.
- After handover, transport, pump change, bag change, or rate change, repeat the line and pump verification.
- Document titration, clinical target, response, maximum/minimum limits, and reason for changes.
- For vesicants and irritants, follow the approved extravasation-prevention and management process and ensure the relevant antidote or treatment resources are available.

18. Concentrated electrolytes and other restricted products

- Concentrated electrolytes shall not be routinely stored in unrestricted ED clinical areas unless a documented risk assessment and approved safeguards justify access.
- Use pharmacy-prepared or commercially premixed solutions whenever available.
- When bedside preparation is unavoidable, require a complete order, approved dilution reference, independent check, immediate labelling, pump administration where indicated, and prescribed monitoring.
- Store concentrated electrolytes, neuromuscular blockers, and other restricted medicines separately with clear warning labels and controlled access.
- Neuromuscular blocking agents shall never be stored or presented in a way that could be confused with sedatives, vaccines, or routine emergency medicines and shall only be used where airway and ventilation capability is immediately available.

19. Controlled medicines, wastage, and security

- Controlled medicines shall be stored, issued, administered, wasted, reconciled, and audited according to national law and the hospital controlled-drug policy.
- Access is limited to authorized staff; keys, codes, and electronic credentials must not be shared.
- Record receipt, patient administration, wastage, balance, discrepancy, and witness details as required.
- Investigate unresolved count discrepancies immediately and escalate according to the controlled-drug procedure.
- Dispose of unused or expired controlled medicines through the approved witnessed process; do not discard into ordinary waste or sinks unless specifically authorized.

20. Medication storage, stock, and environmental control

- Store medicines under manufacturer and pharmacy requirements for temperature, light, humidity, security, and segregation.
- Monitor and document refrigerator and controlled-room temperatures; quarantine stock after an out-of-range event until pharmacy determines suitability.
- Separate LASA medicines and different strengths where practicable; use tall-man lettering or other locally approved visual differentiation.
- Keep external-use, oral, injectable, and hazardous products separated when this reduces selection error.
- Use first-expiry-first-out stock rotation and remove expired, recalled, damaged, contaminated, or obsolete stock promptly.
- Standardize resuscitation trolleys and emergency medication kits; seal and check them at defined intervals and after use.
- Limit floor stock to medicines required for timely ED care. Review rarely used or high-risk stock regularly.
- Communicate shortages, substitutions, concentration changes, and recalls through a reliable system that reaches every shift.

21. Patient-owned medicines and self-administration

- Patient-owned medicines shall be identified, reconciled, assessed for integrity and authenticity, stored securely, and documented.
- Use of a patient's own medicine requires an authorized order and compliance with local pharmacy policy, except for immediate time-critical use when delay creates greater risk and verification is sufficient.
- Do not use unlabelled, expired, contaminated, deteriorated, counterfeit-suspected, or unverifiable products.
- Self-administration in the ED requires a documented assessment of capacity, understanding, physical ability, storage, timing, and monitoring, together with an authorized plan.
- Return, transfer, or dispose of patient-owned medicines according to policy and document the disposition.

22. Monitoring, omitted doses, and reassessment

- Define expected benefit, onset, duration, important adverse effects, and required observations before administration.
- Record relevant baseline and follow-up measures, such as pain score, sedation and respiratory status, blood pressure, ECG, glucose, electrolytes, renal function, bleeding, temperature, or mental state.
- Reassess after one-time, stat, IV, sedating, vasoactive, hypoglycaemic, opioid, anticoagulant, antiarrhythmic, or other high-risk therapy within the locally defined interval.
- An omitted, refused, delayed, unavailable, or withheld dose requires a reason, clinical assessment, and escalation when the medicine is time-critical or omission may cause harm.
- Do not repeatedly chart "not available" or "patient absent" without active resolution of the underlying problem.
- Unexpected deterioration after medication administration shall be treated as a possible adverse drug event until assessed otherwise.

23. Adverse drug reactions, medication errors, and extravasation

23.1 Immediate patient response

- Stop or withhold the suspected medicine when clinically appropriate and call for urgent help if the patient is unstable.
- Provide ABCDE assessment and treatment using the relevant emergency pathway, including anaphylaxis, overdose, bleeding, hypoglycaemia, oversedation, arrhythmia, or extravasation management as applicable.

- Preserve relevant containers, syringes, infusion devices, labels, and records when an error or product problem is suspected.
- Notify the responsible clinician and pharmacy service; obtain toxicology, poison-centre, specialist, or manufacturer advice when needed.
- Document the event, clinical findings, treatment, response, suspected medicine, route, dose, timing, lot/batch where relevant, and follow-up.

23.2 Reporting and learning

- Enter allergies and confirmed or strongly suspected serious reactions into the approved allergy/adverse-reaction record before disposition.
- Report serious or unexpected reactions through the national pharmacovigilance process where applicable.
- Report medication errors and near misses through the hospital incident system without delaying patient care.
- Disclose significant harm to the patient or representative according to the hospital's open-disclosure policy.
- Review events for system contributors: packaging, storage, workload, interruptions, knowledge, communication, technology, staffing, availability, or policy design.
- Implement and track corrective actions; do not rely solely on reminders or retraining when system redesign is possible.

24. Antidotes, reversal agents, and toxicology resources

- The hospital shall maintain a locally approved list of antidotes and reversal agents, minimum stock levels, storage locations, access process, dosing references, monitoring, replenishment, and transfer triggers.
- Reversal decisions shall consider the severity of toxicity or bleeding, medicine involved, timing, organ function, thrombotic or rebound risk, and availability of definitive care.
- Antidotes with complex preparation or short stability require readily accessible instructions and simulation training.
- When an antidote is unavailable, immediately contact the designated referral centre, poison service, pharmacy, transport coordinator, and accepting facility as appropriate.
- After antidote or reversal therapy, continue monitoring for recurrence, delayed toxicity, treatment complications, and need for transfer.

25. Discharge medication safety

- Complete medication reconciliation before discharge and compare the final list with the pre-ED list and medicines administered in the ED.
- Clearly identify medicines to continue, stop, change, or start; provide dose, route, frequency, duration, indication, and review plan.
- Check allergies, interactions, duplication, organ function, pregnancy, access, affordability, availability, health literacy, and ability to obtain and use the medicine safely.
- Avoid ambiguous instructions such as “take as directed” unless the direction is also fully written and understood.
- Explain important precautions, likely side effects, warning symptoms, driving or alcohol restrictions, storage, missed-dose advice, and return precautions.
- For antibiotics, steroids, anticoagulants, opioids, insulin, sedatives, and other high-risk discharge medicines, provide focused counselling and monitoring/follow-up arrangements.
- Use teach-back and provide a written reconciled medication list in the patient's preferred language or accessible format where feasible.
- Communicate significant changes to the primary-care clinician, specialist, pharmacist, facility, or receiving service according to local arrangements.
- Document prescriptions, counselling, teach-back, supply given, access barriers, and follow-up responsibility.

26. Admission, handover, and interfacility transfer

- Reconcile and hand over all medicines given, infusions running, last dose times, next due times, intentionally withheld medicines, omitted doses, allergies, reactions, monitoring, and anticipated adverse effects.
- Use a structured handover and identify the clinician or team accepting medication responsibility.
- Ensure adequate medicine supply, infusion volume, batteries, pumps, oxygen, monitoring, antidotes, and competent escort for the transport duration plus contingency reserve.
- Label every infusion, syringe, line, and patient-specific medication before transfer.
- Provide copies of medication orders, administration record, relevant results, and monitoring parameters.
- For overseas or off-island transfer, confirm that the transport team and receiving facility can continue the medicine safely and that controlled medicines meet legal transport requirements.

27. Downtime, shortages, recalls, and supply interruption

- Use approved paper order and administration records during electronic downtime, preserving patient identification, allergies, time stamps, and signatures.
- Reconcile all downtime medication records into the permanent system when restored and check for duplicate or omitted orders.
- Pharmacy shall communicate shortages, concentration or brand changes, substitutions, restricted indications, conservation measures, and expected duration.
- Alternative therapy must be clinically reviewed for dose equivalence, route, preparation, monitoring, interactions, and patient education.
- Recalls require immediate identification and quarantine of affected stock, review of patients exposed, notification, and documentation.
- During refrigerator, power, oxygen, pump, or supply failure, activate the hospital contingency plan and prioritize high-risk medicines and patients.

28. Documentation standards

- Document allergy inquiry and reaction details, medication history sources, reconciliation status, orders, verification, preparation where required, administration, monitoring, response, omissions, refusal, waste, and handover.
- Chart administration immediately after it occurs except during resuscitation, when contemporaneous event recording is used and completed as soon as possible.
- Never pre-chart a medicine as given. Correct errors with a traceable addendum or amendment under the health-record policy.
- Document the clinical reason for overrides, emergency exceptions, non-formulary use, unusual doses, high-risk titration, and intentional medication changes.
- Where a barcode or electronic administration system is used, bypasses and workarounds shall be rare, clinically justified, and auditable.
- Patient education and teach-back should be recorded for high-risk medicines and major medication changes.

29. Quality indicators and audit

Indicator	Suggested measure
Allergy documentation	Percentage of ED encounters with active allergy/adverse-reaction status documented before first non-emergency medication.
Weight documentation	Percentage of paediatric and weight-based medication encounters with measured weight in kilograms recorded.

Indicator	Suggested measure
Medication reconciliation	Percentage of admitted/transferred/discharged patients with completed reconciliation and unresolved discrepancies.
High-alert compliance	Percentage of sampled high-alert administrations meeting required safeguards and monitoring.
Administration documentation	Percentage of sampled doses with complete patient, medicine, dose, route, time, and administrator documentation.
Omitted time-critical medicines	Number and rate of delayed or omitted locally designated time-critical doses.
Medication incidents	Rate and severity of medication errors, near misses, adverse drug events, and serious reactions; recurring system themes.
Discharge communication	Percentage of sampled discharges with a reconciled list, documented changes, counselling, and follow-up.
Stock and storage safety	Compliance with expiry, refrigerator, emergency-cart, controlled-drug, LASA, and high-alert storage checks.
Learning actions	Percentage of medication-safety corrective actions completed and sustained by target date.

30. Training, competency, and implementation

- All relevant staff shall receive induction and periodic training in this protocol, medication reconciliation, high-alert safeguards, paediatric calculations, infusion pumps, anaphylaxis, overdose/reversal, incident reporting, and downtime procedures.
- Competency shall be assessed for IV preparation and administration, infusion pumps, point-of-care medication devices, controlled medicines, paediatric dosing, procedural sedation, and other locally designated high-risk tasks.
- Run multidisciplinary simulations for resuscitation medication workflow, verbal orders, high-alert infusion setup, anaphylaxis, opioid toxicity, hypoglycaemia, anticoagulant bleeding, extravasation, and shortages.
- Implement the protocol with completed local annexes, accessible references, pharmacy and nursing workflow testing, day/night pilot testing, and executive support.
- Review implementation after 3, 6, and 12 months and after any serious medication event or major formulary/technology change.

Annex A. One-page ED medication safety workflow

Step	Bedside action
1. Identify	Use two identifiers; confirm age and current encounter.
2. Assess	Indication, allergies, medication history, weight, pregnancy, organ function, interactions, prior doses, and monitoring.
3. Prescribe	Complete unambiguous order; approved reference; no unsafe abbreviations; define duration and monitoring.
4. Verify	Correct patient, medicine, dose, form, route, time, product, expiry, and high-alert safeguards.
5. Prepare	Clean area; correct calculation/dilution; compatible product; label immediately.
6. Administer	Repeat bedside rights/checks; explain; use correct line/site/rate; document after giving.
7. Monitor	Assess effect and toxicity within the required interval; escalate deterioration.
8. Reconcile	At admission, transfer, and discharge: continue, stop, change, or start; communicate and document.
9. Learn	Report reactions, errors, near misses, shortages, and unsafe conditions.

STOP and clarify whenever the medicine, dose, route, patient, label, calculation, timing, or clinical state does not make sense.

Annex B. Minimum medication history and reconciliation dataset

Field	Minimum record
Patient identifiers	Name plus second approved identifier; current encounter.
Information sources	Patient, caregiver, bottles/photo, pharmacy, record, clinician; reliability and gaps.
Allergies / reactions	Substance, reaction, severity, timing, treatment, and tolerated alternatives if known.
Regular medicines	Name, strength, dose, route, frequency, indication, last dose, adherence.
Non-prescription products	OTC, supplements, herbal/traditional products, recreational substances where relevant.
Recent changes	Started, stopped, changed dose, short courses, recent hospitalization.
Time-critical medicines	Medicine, last dose, next due dose, consequence of delay.
Reconciliation outcome	Continue, stop, change, start, hold; reason; unresolved discrepancy and owner.
Disposition communication	Receiving team/patient informed; written list supplied; follow-up owner.

Annex C. Medication administration checklist

- ☐ Two patient identifiers match the active order and medication record.
- ☐ Allergy/adverse-reaction status checked and clinically relevant reaction considered.
- ☐ Indication remains appropriate for the patient’s current condition.
- ☐ Medicine, strength, formulation, dose, route, time, and duration match the order.
- ☐ Weight and calculation verified where relevant; maximum and cumulative doses checked.
- ☐ Required vital signs, laboratory values, glucose, ECG, pain/sedation score, or other prerequisites reviewed.
- ☐ Product integrity, expiry, storage, dilution, concentration, compatibility, and label are correct.
- ☐ High-alert safeguard / independent check completed when required.
- ☐ Correct access, line, site, pump, rate, and monitoring available.
- ☐ Patient informed where feasible and refusal/questions addressed.
- ☐ Administration documented after giving; response and adverse effects monitored.

Annex D. Local high-alert medication register

Medication / class	Primary harm if error occurs	Approved concentration / form	Storage / access control	Independent check step	Monitoring / antidote	Owner

Annex E. Independent double-check record

Verification element	Checker 1	Checker 2
Patient identifiers		
Allergy status		
Medicine / indication		
Weight / dosing weight		
Dose and separate calculation		
Concentration / diluent / total volume		
Route / access / site		
Pump rate / dose units / limits		
Maximum / cumulative dose		
Monitoring / antidote availability		
Discrepancy resolved before administration		
Names / signatures / time		

Annex F. Paediatric and weight-based dose worksheet

Field	Entry
Patient identifiers	
Measured weight (kg) and time	
Dosing weight used and reason	
Medicine and indication	
Reference / pathway	
Dose factor (e.g., mg/kg)	
Calculated dose	
Maximum dose / dose cap	
Available concentration	
Volume to administer	
Diluent / final concentration / total volume	
Route / rate / timing	
Required monitoring	
Independent checker	

Annex G. Infusion initiation and handover checklist

- ☐ Active order includes medicine, indication, total amount, diluent, final volume/concentration, route, starting rate, titration, limits, monitoring, and stop/wean instruction.
- ☐ Patient identity, allergy status, weight, access, and required baseline data confirmed.
- ☐ Bag/syringe label and pump library entry match the order.
- ☐ Line traced from source to patient; lumen and compatibility confirmed.
- ☐ Independent check completed where required.
- ☐ Clinical target and reassessment interval documented.
- ☐ At handover/transfer: remaining volume, current rate, last change, response, adverse effects, line/site, pump settings, and next review communicated.
- ☐ After handover or transport, receiving staff repeat pump and line verification.

Annex H. Adverse drug event / medication error immediate response

Action	Minimum requirement
1. Protect the patient	Stop/withhold when appropriate; call for help; ABCDE; treat the reaction or toxicity.
2. Identify exposure	Medicine, dose, route, time, product/lot, infusion/device, co-medications, and patient factors.
3. Obtain advice	Responsible clinician, pharmacist, toxicology/poison service, specialist, or manufacturer as indicated.
4. Monitor	Vital signs, ECG, glucose, laboratory values, bleeding, sedation, tissue injury, or delayed toxicity.
5. Preserve evidence	Retain packaging, labels, syringe/bag, pump logs, and relevant records when safe.
6. Document and communicate	Clinical record, allergy/reaction status, handover, patient disclosure, and follow-up.
7. Report	Incident system and pharmacovigilance where applicable.
8. Learn	System review, corrective action, owner, deadline, and effectiveness check.

Annex I. Discharge medication safety checklist

- ☐ Medication reconciliation completed against the best available pre-ED list.
- ☐ Continue / stop / change / start decisions are explicit and intentional.
- ☐ Allergy, interaction, duplication, organ-function, pregnancy, and access checks completed.
- ☐ Dose, route, frequency, duration, indication, and review plan are written clearly.
- ☐ Patient has the medicine or a realistic plan to obtain it.
- ☐ Important side effects, precautions, missed-dose advice, storage, and warning symptoms explained.
- ☐ High-risk medicine monitoring and follow-up arranged.
- ☐ Teach-back confirms understanding; interpreter or caregiver involved where needed.
- ☐ Written reconciled list supplied and major changes communicated to the next clinician/service.
- ☐ Counselling, supply, access barriers, and follow-up responsibility documented.

Annex J. Medication storage and resuscitation-stock checklist

Check	Compliant	Action / owner / due date
Stock matches approved ED formulary and par levels		
No expired, recalled, damaged, or unlabelled product		
Refrigerator temperature and excursion process current		
Controlled-drug count, security, and records correct		
High-alert and LASA medicines separated and labelled		
Concentrated electrolytes and neuromuscular blockers restricted		
Emergency trolley sealed, standardized, in date, and complete		
Antidotes / reversal agents available at required levels		
Standard concentrations and current references accessible		
Shortages / substitutions / concentration changes communicated		

Annex K. Medication-safety audit tool

Audit item	Yes	No	N/A	Notes / evidence
Two patient identifiers used				
Allergy/adverse-reaction status actively documented				
Indication and complete order evident				
Unsafe abbreviation / decimal avoided				
Weight in kg documented when required				
Dose and organ-function adjustment appropriate				
Preparation and labelling requirements met				
High-alert safeguard / independent check completed				
Administration time, route, dose, and administrator documented				
Required monitoring and response documented				
Omitted/delayed/refused dose assessed and resolved				
Medication reconciliation completed at transition				
Discharge changes and counselling documented				
Incident or adverse reaction reported when indicated				

Annex L. Local configuration table

Item requiring local approval	Approved arrangement
ED formulary and non-formulary authorization process	
Current adult and paediatric dosing references	
Medication reconciliation responsibility and priority groups	

Item requiring local approval	Approved arrangement
Time-critical medication list and acceptable delay	
High-alert medication list and specific safeguards	
Independent double-check list and emergency exception	
Standard concentrations, dilutions, and infusion pump library	
LASA list, tall-man lettering, storage, and labelling	
Concentrated electrolyte and neuromuscular-blocker controls	
Verbal/telephone order and authentication timeframe	
Controlled-drug access, count, waste, and discrepancy process	
Antidote/reversal stock levels and locations	
Extravasation kit and treatment protocol	
Medication refrigerator and temperature-excursion process	
Shortage, substitution, recall, and downtime process	
Medication incident and pharmacovigilance reporting	
Discharge supply limits and counselling responsibility	
Audit schedule and accountable committee	

Annex M. References and source tools

World Health Organization. Medication Without Harm. <https://www.who.int/initiatives/medication-without-harm>

World Health Organization. Medication without harm: policy brief.

<https://www.who.int/publications/i/item/9789240062764>

World Health Organization. Medication safety in high-risk situations. <https://www.who.int/publications-detail-redirect/medication-safety-in-high-risk-situations>

World Health Organization. Medication safety in transitions of care.

<https://www.who.int/publications/i/item/WHO-UHC-SDS-2019.9>

World Health Organization. Medication safety in polypharmacy. <https://www.who.int/publications-detail-redirect/medication-safety-in-polypharmacy-technical-report>

World Health Organization. Medication safety for look-alike, sound-alike medicines.

<https://www.who.int/publications/i/item/9789240058897>

Institute for Safe Medication Practices. High-Alert Medications in Acute Care Settings.

<https://www.ismp.org/tools/highalertmedications/>

Institute for Safe Medication Practices. List of Error-Prone Abbreviations, Symbols, and Dose Designations.

<https://www.ismp.org/Tools/abbreviations/>

Agency for Healthcare Research and Quality. MATCH toolkit for medication reconciliation.

<https://www.ahrq.gov/patient-safety/settings/hospital/match/index.html>

The Joint Commission. National Performance Goals effective January 2026 for the Hospital Program, including medication management and accurate medication information.

<https://www.jointcommission.org/en-us/standards/national-performance-goals>

Local formulary, pharmacy manual, controlled-drug policy, antimicrobial guidelines, resuscitation algorithms, procedural-sedation policy, infusion standards, and national medicines law. [Insert local sources]

Reference note: External standards support the governance principles in this draft. Before approval, reconcile the document with national medicines law, the hospital formulary, available pharmacy services, local scopes of practice, current product information, and the institution's approved adult and paediatric references.

Local approval and sign-off

Role	Name	Signature	Date
Emergency Department Medical Lead			
Emergency Department Nursing Lead			
Chief / Lead Pharmacist			
Medication Safety / Pharmacy and Therapeutics Chair			
Paediatric Lead			
Obstetric Lead, if applicable			
Clinical Governance / Patient Safety Lead			
Medical Executive			
Nursing Executive			
Hospital Administrator / Board Representative			

Before approval, complete Annexes D and L, validate every high-alert safeguard and standard concentration, test the workflow on day and night shifts, and confirm reliable pharmacy, antidote, infusion, and reconciliation support.