RFDS Queensland section Clinical Practice Guidelines Manual new section

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Title: Retrieval sedation guidelines for the acutely disturbed patient

Objectives:

1. Provide standardized clinical approach for the sedation of a patient requiring aeromedical transport who is acutely disturbed
2. Maintain minimum standards of sedation assessment and monitoring in the aeromedical and retrieval setting
3. Enhance patient and transport team safety

Absolute contraindications to retrieval sedation:

- Known allergies/adverse reactions to RFDS QLD sedative agents

Relative contraindications to retrieval sedation:

- Recent ingestion of food (last 6 hrs) or clear fluids (last 2 hrs)
- Respiratory tract disease/infection
- Substance abuse/intoxicated state

Rationale/background:

The aeromedical and remote retrieval setting that the RFDS QLD section operates in has unique constraints in the management of the acutely disturbed patient. Limited space, excessive noise, vibration are all elements that may exacerbate patient agitation. Transport times may necessitate prolonged periods of sedation. The RFDS QLD protocol dictates the procedure to assess the risk for disturbed behavior during transport and outlines levels of risk management. Acute sedation is part of this risk management strategy along with physical restraints and appropriate escort mix.

There is a paucity of evidence base in the aeromedical and psychiatric literature to guide the practice of acute sedation in the air transport and remote retrieval environments. Extrapolation from published sedation articles in the intensive care and emergency department settings has been used in the writing

of this clinical guideline as well as expert clinical advice from a specialist reference group (Acknowledgements to : Professor Ernest Hunter,Dr Geraldine Dyer and Dr Bruce Gynther, remote area psychiatrists, Dr Peter Schuller, consultant anaesthetist, Cairns base hospital, Dr Geoff Ramin, Senior Specialist, Aeromedical and Critical Care Services, RFDS Brisbane)

Disclaimer: This guideline does not replace sound clinical judgment by individual practitioners dealing with specific clinical problems for a given case. The sedation provider is directed to become familiar with the individual drug monographs located within the RFDS MED-05 Clinical practice guidelines Manual when seeking further information about the suggested sedative agents within this guideline.

Definitions

The Australian and New Zealand College of Anaesthetists' professional standards for sedation details the following descriptors:

1. DEFINITIONS

1.1.1 Conscious Sedation is defined as a drug-induced depression of consciousness during which patients are able to respond purposefully to verbal commands or light tactile stimulation. No interventions are usually required to maintain a patent airway, spontaneous ventilation or cardiovascular function. Conscious sedation may be achieved by a wide variety of techniques including propofol and may accompany local anaesthesia.

1.1.2 Deep levels of sedation, where consciousness is lost and patients only respond to painful stimulation, are associated with loss of the ability to maintain a patent airway, inadequate spontaneous ventilation and/or impaired cardiovascular function. Deep levels of sedation may have similar risks to general anaesthesia, and may require an equivalent level of care.

1.2 General Anaesthesia is a drug-induced state characterised by absence of response to any stimulus, loss of protective airway reflexes, depression of respiration and disturbance of circulatory reflexes.

General principles of sedation practice:

1. Sedation during aeromedical transport and retrieval should only occur with a two person transport team caring for the patient. Only unexpected emergencies should require a single provider to resort to acute sedation.

2. The sedation provider must have the necessary resuscitation skills and pharmacologic knowledge to rescue a patient from sedation that is causing airway obstruction and /or cardiorespiratory deterioration.

3. All sedation should be undertaken with a targeted sedation level goal with concomitant reduction in agitation level. A standardized sedation/agitation score should be used to maintain consistent and reliable sedation practice for a targeted effect.

4. As much as is practically possible, retrieval sedation should be conducted in a planned and properly timed manner with proper airway and medical assessment, establishment of IV access and monitoring, informed consent and standardized sedation/agitation scoring. The recommended location to initiate retrieval sedation is in a hospital/facility setting. It is important to initiate primary sedation well before the aircraft is tasked, that is, the patient should be pre-dosed with sedating antipsychotics until sedate and drowsy prior to RFDS aircraft tasking. This may require repeated telephone assessments via the treating doctor and much encouragement to titrate doses of antipsychotics and benzodiazepines up until the desired sedation has occurred (refer to elective sedation section below).

5. Sedation should never be regarded as the mainstay of risk management for the disturbed patient. Physical security in the form of restraints and trained escorts must be utilized as per the current RFDS protocol. Sedation allows better tolerance of the physical restraint.

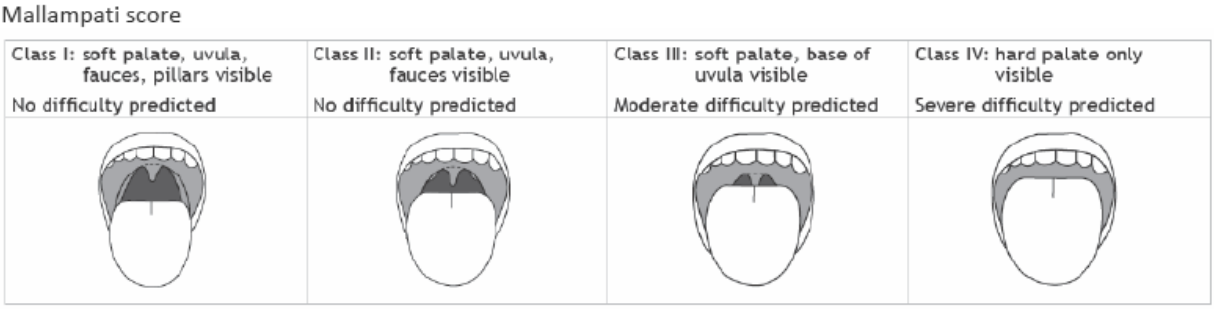
6. Planned retrieval sedation should be monitored using similar levels of charting, observation and nursing care as accorded for a ventilated anaesthetic patient.

Retrieval sedation assessment/planning and monitoring

1. Prior to any retrieval sedation the following assessments are recommended if practical and feasible to perform:

- Airway assessment – a Mallampati score should be documented. Ideally patient is sitting up and voluntarily opening the mouth to the examiner. See Figure 1 below. Class 3-4 Mallampati should be considered high risk for problems of hypoxia, airway obstruction and difficult airway management during sedation. Problems with bag /mask ventilation can be predicted with one or more of the following patient factors:
    - Beard
    - Male
    - Obesity
    - Past radiotherapy to airway
    - Elderly
    - Suspected or known obstructive sleep apnoea

Figure 1 Mallampati classification



- Medical assessment – fasting status , recent respiratory tract infection, an ASA class and allergies should be documented. See description below. In general ASA class I – 2 are suitable candidates for elective sedation.

- **ASA Classification (American Society of Anaesthesiologists)**

Class 1	Healthy patient, no medical problems
Class 2	Mild systemic disease (No functional limitations; has a well-controlled disease of one body system; controlled hypertension or diabetes without systemic effects, cigarette smoking without chronic obstructive pulmonary disease (COPD); mild obesity, pregnancy)
Class 3	Severe systemic disease, but not incapacitating (Some functional limitation; has a controlled disease of more than one body system or one major system; no immediate danger of death; controlled congestive heart failure (CHF), stable angina, old heart attack, poorly controlled hypertension, morbid obesity, chronic renal failure; bronchospastic disease with intermittent symptoms)
Class 4	Severe systemic disease that is a constant threat to life(Has at least one severe disease that is poorly controlled or at end stage; possible risk of death; unstable angina, symptomatic COPD, symptomatic CHF, hepatorenal failure)
Class 5	Moribund, not expected to live 24 hours irrespective of operation
An **e** is added to the status number to designate an emergency operation. An organ donor is usually designated as Class 6	

2. The Richmond agitation-sedation scale is a validated scoring system in the ICU setting and is recommended to be used to assess agitation and target a sedation level appropriate for the disturbed transport patient. A RASS score should be documented prior to any sedation administration and a target RASS score should be clearly documented or communicated to other

retrieval team members as a major goal of the sedation plan. The recommended target RASS score for retrieval sedation is between 0 to -3. At times during a retrieval, periods of brief but intense environmental stimuli (engine startup, helicopter phase) may necessitate a deeper level of sedation, a RASS score to -4 maybe appropriate. It is considered inappropriate to target a RASS score of -5 at anytime for planned retrieval sedation unless the decision to intubate and ventilate has been made. The RASS score should be documented regularly throughout the retrieval as frequently as the vital sign observations are recorded.

Disclaimer : Whilst the RASS is to be used as a tool to guide sedation targets it does not replace clinical judgement on a case by case basis as to the level of sedation required for a given patient and situation.

Sessler CN et al. AJRCCM 2002 ;166(10) :1338-44

TABLE 1. RICHMOND AGITATION–SEDATION SCALE

Score	Term	Description
+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitation	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient–ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
−1	Drowsy	Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice
−2	Light sedation	Briefly (less than 10 seconds) awakens with eye contact to voice
−3	Moderate sedation	Any movement (but no eye contact) to voice
−4	Deep sedation	No response to voice, but any movement to physical stimulation
−5	Unarousable	No response to voice or physical stimulation

Procedure

1. Observe patient. Is patient alert and calm (score 0)?
   Does patient have behavior that is consistent with restlessness or agitation (score +1 to +4 using the criteria listed above, under DESCRIPTION)?
2. If patient is not alert, in a loud speaking voice state patient's name and direct patient to open eyes and look at speaker. Repeat once if necessary. Can prompt patient to continue looking at speaker.
   Patient has eye opening and eye contact, which is sustained for more than 10 seconds (score −1).
   Patient has eye opening and eye contact, but this is not sustained for 10 seconds (score −2).
   Patient has any movement in response to voice, excluding eye contact (score −3).
3. If patient does not respond to voice, physically stimulate patient by shaking shoulder and then rubbing sternum if there is no response to shaking shoulder.
   Patient has any movement to physical stimulation (score −4).
   Patient has no response to voice or physical stimulation (score −5).

3. Sedation monitoring: The minimum set of monitoring for any retrieval sedation must include

   - continuous pulse oximetry of oxygen saturation

   - regular non invasive blood pressure measurement

   - continuous cardiac rhythm monitoring

   - a sedation provider who is skilled in airway management and BVM rescue ventilation

- use of the RASS scoring for sedation/agitation level

Additional sedation monitoring with CO2 monitoring (waveform capnography) via the RFDS ETCO2 inline sensor inserted into the side port of a standard adult oxygen face mask may be helpful to detect early respiratory depression , airway obstruction and apnoea in the aeromedical environment. The use of waveform capnographic monitoring is recommended when maintenance sedation infusions are utilized in the unintubated patient and when RASS scores of -3 to -4 are targeted. A capnographic value >50, an absent waveform or a change in capnographic reading of >10 are useful indicators of decreased ventilation during sedation and should necessitate urgent assessment and action in the sedated patient.

4. Sedation equipment setup: Locate and prepare for use the following

- Oral suction
- Oral and nasal airways of appropriate size
- Oxygen with mask or nasal cannulae
- Functioning bag/valve mask
- RFDS advanced airway bag
- Sedative agents drawn up in labeled syringes
- RFDS Drug Pack 1

<u>Emergency sedation (unplanned)</u>:

Goals:

1. Rapid control of agitation/dangerous behavior(RASS score +3 to +4)
2. Allow safe assessment and treatment of a patient

Legal context of emergency sedation:

If there is an urgent need to use chemical sedation for the purposes of reducing the risk of serious injury to the patient or others involved in their care OR to facilitate urgent medical procedures required to preserve life or prevent significant disability then such use constitutes action taken by a health care provider under the Guardianship Act of Queensland. This is distinct from the Mental Health Act. It must be used for acute emergencies only.

Common retrieval scenarios:

- Acute delirium, organic brain syndrome
- Behavioural disorder secondary to dementia process
- Mental illness with acute agitation during handover

(these conditions may be caused, precipitated by or compounded by alcohol or illicit substance use)

Key principles of emergency sedation:

1. Be safe. Better to decline a transport than try rapid sedation over a short time frame and have it fail during take off.
2. Seek a second provider/assistant to help administer sedation and care to the agitated patient. Care does not end once the sedative is administered and taking effect. You will require help to secure restraints, do a proper medical assessment and establish monitoring and most importantly decide what to do next on the retrieval!
3. Talk to your retrieval team. Acute agitation is a high risk to all on the retrieval. As a sedation provider your colleagues must be aware of your sedation goals, likely effects, expected problems and your contingency plans. Involve them in your sedation decisions.
4. Take extreme caution when the patient is in an obviously intoxicated state. Acute sedation with any agent carries significant risks of aspiration and unpredictable levels of sedation achieved

RFDS QLD EMERGENCY SEDATION PROTOCOL

Pre-retrieval sedation assessment:

Prior to emergency sedation being initiated by the retrieval team, there should be a review and assessment of the preceding sedation agents and dosages used in the last 24hrs. This may help predict those patients who maybe tolerant to benzodiazepines and may require second line sedatives such as ketamine.

IV ACCESS NOT OBTAINED YET

- **Always offer oral sedation initially**. RFDS drug pack 2 has Olanzapine 10 mg wafers. This is the only oral sedative available onboard the aircraft.

  Dose = 10-20 mg olanzapine wafer PO stat dose. Does not require a drink for administration as will dissolve in mouth.

  Rationale for oral dosing: Asking the patient to take a tablet orally allows a provider to determine the need for further escalation in the response to the agitation and to determine the next sedative agent most appropriate. It allows for patient compliance (and potential for further cooperation) to be tested and if the oral dose is accepted will establish a degree of sedation for a short period of time as well as initiate antipsychotic therapy during the pre-hospital phase of patient care (if not already done prior to retrieval)

  In the event an antipsychotic has already been administered during the prior 24hrs of patient care, olanzapine wafer is still recommended as an initial sedative dose

- **ORAL DOSING REFUSED :** Patient compliance is unlikely to allow IMI or IV access. This is a high risk scenario and requires immediate sedative control of behavior that is posing a serious risk to safety of all. Physical restraints should be utilized as much as possible. If on the ground, ambulance and/or police assistance should be requested as soon as possible. Medication administration should not be attempted until there is adequate physical security/control of the situation. The optimal number of persons required for safe physical restraint is 5.

  Rapidly acting IMI sedatives recommended -

  - IMI Midazolam 5-10 mg
  - IMI haloperidol 5-10mg (preferred agent for adult sedation by a solo provider) (Warning : this agent can cause dystonic reactions and prolong QT interval)
  - IMI ketamine 4mg/kg (preferred agent for paediatric cases and alternative when solo sedation provider)

    (Warning : this agent can cause hypertonicity which may require midazolam treatment ; it can cause hypersalivation which may require atropine treatment; it can cause delirium and hallucinations –see notes below in IV sedation section)
  - IV ACCESS SHOULD BE OBTAINED AS A PRIORITY AFTER IMI SEDATION HAS TAKEN EFFECT
  - Benztropine 1-2 mg IVI/IMI(adult dose) should be available when giving haloperidol to treat possible acute dystonia

- Flumazenil 0.2-0.5mg IVI(adult dose) should be available when giving midazolam if acute reversal is required

Warning: it is beyond the scope of this guideline to detail/describe a safe procedure for the involuntary physical restraint and administration of a sedative injection (IMI or IVI). It is highly recommended that such techniques and strategies to do so be taught and rehearsed during formal training sessions conducted by experienced staff.

IV ACCESS OBTAINED:

Recommended RFDS emergency IV sedation agents (first line) -

- IVI midazolam 2-5mg (Warning : Midazolam is most likely agent to cause airway compromise when given as IV bolus)

IVI haloperidol 5-10mg

- Haloperidol and midazolam can be combined
- Initial bolus of agent every 5-10 min till RASS score +1 or less achieved
- Maintenance infusion is then recommended if aeromedical transport is still warranted.Refer to Elective sedation section below.

Recommended RFDS emergency IV sedation agents (second line) -

- IVI ketamine 1-1.5mg/kg (preferred agent for paediatric cases and if solo sedation provider)
- It is important to ensure ketamine is used as a second line agent after appropriate doses of an antipsychotic (haloperidol or olanzapine) or benzodiazepine (midazolam) have been trialled. This practice minimizes the risks of ketamine induced dysphoria, delirium and psychosis.
- Initial bolus of agent every 5-10 min till RASS score +1 or less achieved
- Maintenance infusion is then recommended if aeromedical transport is still warranted. Refer to Elective sedation section below. The calculated starting infusion rate is only an estimate as there can be considerable patient variability in responding to a given sedative infusion and confounding factors such as other agents already administered that may have a prolonged duration of action. The goal of a maintenance sedative

infusion is to achieve a steady blood concentration for the duration of the retrieval and avoid the need for repeated bolusing of medications.

TARGET SEDATION GOAL

A RASS score of between 0 to -3 is the recommended sedation goal for aeromedical transport. During engine startup, ascent and descent a deeper level of sedation maybe considered to ameliorate the added stressors of noise, vibration and movement. A RASS score of -4 for a short period of time is then appropriate.

POST EMERGENCY SEDATION CARE

1. Minimum sedation monitoring set should be established (SaO2, cardiac rhythm, NIBP)
2. Supplemental oxygen 2-4 L/min via nasal cannulae or mask to maintain SaO2 >94% at all times
3. RFDs physical restraints to be placed if not already and secured to stretcher
4. Position patient in 45deg head up if possible to maximize spontaneous ventilation and minimize risk of aspiration
5. Perform rapid patient assessment for causes of acute agitation (ABCDEFG)

Elective sedation (planned)

This use of sedation is for planned agitation/behavioural management during aeromedical transport. The patient is usually under the Mental Health Act as an involuntary status but may not be.

Common scenarios:

- Hospitalized patient awaiting transport
- Clinic patient awaiting MO assessment and/or transport
- Cooperative patient with history of recent emotional or behavioural lability
- May or may not be already sedated

- Fear of flying expressed
- Considered high risk on the RFDS risk assessment tool
- If considering intubation/ventilation due to predicted high risk, a trial of elective sedation is appropriate initially.

Warning: Elective sedation should be avoided in an intoxicated patient. There are two recommended strategies in this circumstance. Delay transport till intoxication has reduced/resolved OR if urgency to transport, then rapid sequence intubation and ventilation be undertaken to secure airway for transport

PRE-HANDOVER SEDATION

1. During telemedicine consultation and retrieval request/planning phase, the RFDS risk assessment tool should be used to determine risk level and the likely need for retrieval sedation, police escorts and MO flight status.
2. A remote service psychiatrist, RFDS retrieval MO or RSQ clinical coordinator (depending upon the referring clinician and their location) should be consulted in regard to acute sedation prior to the RFDS retrieval team arrival. A RASS score should be determined in consultation with the referring staff and used to target sedation.
3. The following oral sedatives are recommended as appropriate first line agents to trial during this pre-handover phase of a psychiatric aeromedical retrieval:
    - Oral olanzapine 5-20mg, repeat 1hrly prn (maximum daily dose 30mg) AND /OR
    - Oral diazepam 5-20mg, repeat 1hrly prn
    - Target RASS score = 0 to -1
    - Nursing care should be 1:1 with sedated patient in remote setting until retrieval team handover
    - Police attendance is recommended if there is any risk of physical injury or absconding
4. The EMERGENCY SEDATION protocol may need to be used as a guide to management of the agitated patient if oral sedatives are refused or ineffective to help reduce agitation levels. IV access should be a priority goal in the pre-handover phase.

Handover

1. This should be done at the facility where the patient is currently situated. Elective retrieval sedation and/or intubation if warranted should be initiated ideally in a resuscitation or procedural room.

2. A primary survey (ABC) should be performed and IV access x 2 checked and secured. Readily manageable causes of agitation such as low BSL, full bladder and fear of flying should be sought.

3. A RASS score should be determined and charted. Significant agitation (RASS +2 to +4) should be managed using the EMERGENCY SEDATION PROTOCOL above.

4. <u>If the RASS score cannot be reduced to below +2 within 45 min of use of the EMERGENCY SEDATION PROTOCOL then consideration for intubation and ventilation. If RASS score reduced to 0 to -3 within 45 min of emergency sedation the proceed to step 5.</u>

5. If at handover the RASS score is 0 to -3 . The retrieval goal at this point is to maintain the patient in a calm state despite the added external stressors of the aeromedical transport. Therefore one of two courses of action are recommended:

   - **<u>Plan A (wait and see if patient needs further sedation)</u>**

     - Perform airway and medical assessments and document

     - Explain to patient the purposes of transport and the expected retrieval course of events

     - Explain the use of RFDS physical restraints and move the patient over onto the RFDS LifePort stretcher. Apply restraints and observe patient reaction. If further agitation and need for sedation occurs it is recommended to resort to Plan B (see below)

     - Ensure IV access X2 is secured and at least one IV access point has a long extension tube set attached so that drugs can be bolused via this from behind the LifePort stretcher where the flight nurse normally sits.

     - Apply minimum set of sedation monitoring and explain use to patient

     - Ensure at least 15 mg midazolam, 20 mg haloperidol and 20 ml saline flush are drawn up in labelled syringes

     - Prepare basic airway gear and bag/valve mask

     - Transport to aircraft, constantly observing patient reaction and behavior

     - Unless the RASS score is already between -3 to -4 it is recommended to give an IV bolus of midazolam 2-5mg and haloperidol 2-5mg prior to loading of patient and engine startup

     - Nurse in 45 deg head up position

- Apply supplemental oxygen 2-4L/min

- Observe behavior and administer IV midazolam and/or haloperidol as needed to maintain target RASS score range between 0 to -3. If multiple boluses (>2) are required then it is recommended to convert the sedation to Plan B (see below)

- Arrival at destination. If RASS score 0 to -3 on landing then handover to ambulance officers is appropriate. Otherwise hospital/facility handover is recommended.

- **Plan B (initiate maintenance sedative infusion)**

  - Apply minimum set of sedation monitoring and explain use to patient

  - Ensure at least 15 mg midazolam, 20 mg haloperidol and 20 ml saline flush are drawn up in labelled syringes

  - Perform airway and medical assessments and document

  - Explain to patient the purposes of transport and the expected retrieval course of events

  - Explain the use of RFDS physical restraints

  - Ensure IV access X2 is secured and at least one IV access point has a long extension tube set attached so that drugs can be bolused via this from behind the LifePort stretcher where the flight nurse normally sits.

  - Prepare basic airway gear and bag/valve mask

  - **In adults, <u>recommended first line sedative infusion is</u>:**

  The calculated starting infusion rates are only an estimate as there can be considerable patient variability in responding to a given sedative infusion and confounding factors such as other agents already administered that may have a prolonged duration of action. The goal of a maintenance sedative infusion is to achieve a steady blood concentration for the duration of the retrieval and avoid the need for repeated bolusing of medications)

  Midazolam at initial rate of 0.2mg/kg/hr

  Observe effect over 40min from start of infusion and assess vital signs and RASS score at least 10 minutely. If RASS score -4 then should halve infusion rate or monetarily cease infusion (if RASS score -5). If RASS score +2 or higher then boluses of IV haloperidol 2-5mg should be used to acutely reduce agitation initially rather than increasing the midazolam infusion rate.

- **<u>In children or as second line agent for adults</u> (there is a small subset of agitated patients who are tolerant to benzodiazepines in large doses and standard sedative combinations are ineffective acutely):**

Ketamine at initial rate of 1.5mg /kg /hr

Observe effect over 40min from start of infusion and assess vital signs and RASS score at least 10 minutely. If RASS score -4 then should halve infusion rate or monetarily cease infusion (if RASS score -5). If RASS score +2 or higher then boluses of IV ketamine 0.5mg/kg and/or haloperidol 2-5mg should be used to acutely reduce agitation initially rather than increasing the infusion rate.

- Nurse in 45 deg head up position

- Apply supplemental oxygen 2-4L/min

- Move patient onto RFDS stretcher and apply restraints

- If after 40 min of sedative infusion the RASS score is between 0 to -3, vital signs are satisfactory, patient is on RFDS stretcher and has restraints secured, then transport to aircraft can occur

- Unless the RASS score is already between -3 to -4 it is recommended to give an IV bolus of midazolam 2-5mg and/or haloperidol 2-5mg prior to loading of patient and engine startup

- Observe behavior and administer IV midazolam and/or haloperidol as needed to maintain target RASS score range between 0 to -3 during transport

- Arrival at destination. Hospital/facility handover is recommended.

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