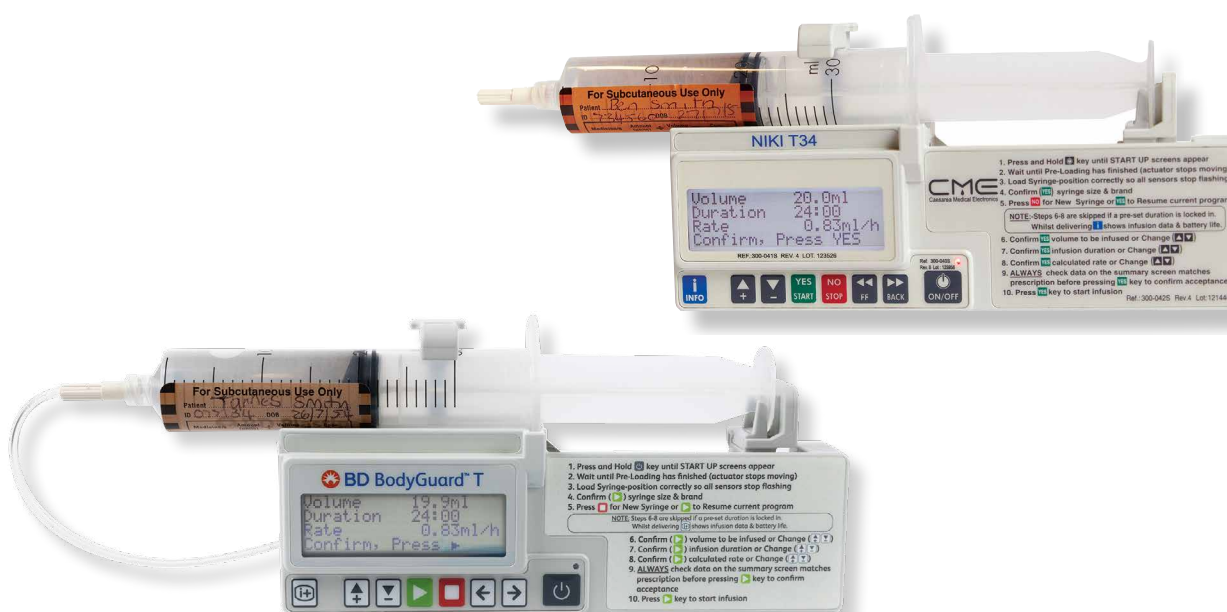


A practical handbook for health professionals:

How to safely set up, commence and provide necessary documentation for NIKI T34™, T34™ and BodyGuard™ T syringe pump infusions.



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Brisbane South Palliative Care Collaborative 2020 

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Disclaimer

This handbook is intended as a guide for health professionals to assist them with safely setting up, commencing and providing necessary documentation for the NIKI T34™, T34™ and BodyGuard™T syringe pump infusions.

While Brisbane South Palliative Care Collaborative has exercised due care in ensuring the accuracy of the material contained in the handbook, the handbook is only a guide to appropriate practice, to be followed subject to the clinician's judgement and local policies and procedures.

Brisbane South Palliative Care Collaborative does not accept any liability for any injury, loss, or damage incurred by use of, or reliance upon, the information provided within this handbook.

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IMPORTANT INFORMATION

- This handbook illustrates the essential elements for ensuring safe delivery of NIKI T34™ and T34™ syringe pump infusions in a palliative care setting.
- The next generation of the NIKI T34™ and T34™ syringe pump, released in 2021, is called the BodyGuard™ T.

- This handbook is relevant for use with the NIKI T34™/T34™ and the BodyGuard™ T as the devices operate in a similar manner.
- For the purposes of this handbook, when NIKI T34™ is written in the text, the information is relevant for NIKI T34™, T34™ and BodyGuard™ T syringe pump infusions.

- The three buttons appearing throughout the text    relate to

- 1) NIKI T34™
- 2) T34™
- 3) BodyGuard™ T.

- Specific information about operation of the BodyGuard™ T syringe pump is included on pages 8, 9, 12, 22-25.

Introduction

This practical handbook is part of a learning package that aims to enable health professionals to develop skills and knowledge and ultimately demonstrate competency in safely setting up, commencing and providing necessary documentation for NIKI T34™ syringe pump infusions. The package is relevant to all clinical settings – community, residential aged care and inpatient.

Components of the learning package

*** It is recommended that health professionals review all the following elements of the learning package prior to completing the competency checklist.**

| | | |
|---|---|---|
| 1 | A practical handbook for health professionals: How to safely set up, commence and provide necessary documentation for NIKI T34™, T34™ and BodyGuard™ T syringe pump infusions | This handbook contains the essential information needed to safely set up, commence and provide necessary documentation for NIKI T34™, T34™ and BodyGuard™ T syringe pump infusions |
| 2 | Setting up and commencing NIKI T34™, T34™ and BodyGuard™ T syringe pump infusions with a new syringe: A step-by-step guide | This illustrated guide explains how to use a NIKI T34™, T34™ and BodyGuard™ T syringe pump using a step-by-step approach |
| 3 | Short training videos | Three videos illustrate some of the essential elements for ensuring safe delivery of NIKI T34™, T34™ and BodyGuard™ T syringe pump infusions: <ul style="list-style-type: none">• Video 1 – Using syringe pumps in the palliative care clinical environment• Video 2 – Getting to know the NIKI T34™ syringe pump• Video 3 – Starting and subsequent day set up of NIKI T34™ syringe pump infusions |
| 4 | Online education module | The online education module aims to educate health professionals about how to safely use the NIKI T34™, T34™ and BodyGuard™ T syringe pump |
| 5 | A competency checklist | This checklist describes the requirements for ongoing demonstration of competency for safe and effective use of the NIKI T34™, T34™ and BodyGuard™ T syringe pump |

Additional resources

Additional resources to support the use of the NIKI T34™, T34™ and BodyGuard™ T syringe pump for:

- Organisations: Example policy and procedures – Using a NIKI T34™ syringe pump
- Families: Information sheet for families – [About the NIKI T34™, T34™ and BodyGuard™ T syringe pump](#)

Assumed knowledge

Syringe pumps are used in palliative care to deliver medicines subcutaneously to help manage symptoms and keep a person as comfortable as possible. As part of the clinician's role in caring for a person in a palliative care setting the following knowledge is assumed:

- [The goals of palliative care](#)
- [Common palliative care symptoms](#)
- [How to assess a patient's symptoms](#)
- [Common medicines used in palliative care](#)

Competency

To demonstrate competency in the safe use of a NIKI T34™ syringe pump, a health professional needs to:

- Complete the online education module and generate a Certificate of Completion
- Demonstrate competency to an organisation's nominated NIKI T34™ syringe pump assessor (competent health professional) using the competency checklist.

Further information

The manufacturers of the NIKI T34™ syringe pump have a comprehensive instruction manual if more detailed information is required.

[2nd edition user manual](#) [3rd edition user manual](#)⁽³⁾ [BodyGuard™ T user manual](#)

For further or related information, it is the responsibility of the clinicians to contact their service managers.

About syringe pumps

A syringe pump is a portable battery-operated device that delivers medicine at a constant rate over an extended period (usually 24 hours) to maintain a steady blood level of the medicine.

The syringe pump delivers medicine through a system including:

- **A subcutaneous cannula**, which is placed in the subcutaneous tissue and held in place by a clear dressing
- **An extension set** – The subcutaneous cannula is connected to the syringe pump via a variable length of sterile tubing often called an extension set
- **The syringe** – The extension set is attached to a syringe which can contain various medicines as prescribed by a doctor or nurse practitioner for symptom control

The syringe pump pushes the syringe plunger at a steady rate and medicine is delivered through the extension tube and subcutaneous cannula under the person's skin. The medicine can then be absorbed into the body.

Why are syringe pumps used?

Continuous subcutaneous infusion of medicines administered using a syringe pump is a common and accepted practice in palliative care for assisting with pain and symptom management when other routes of administration are inappropriate or ineffective.

The use of syringe pumps, particularly in the last days of life, has made a significant contribution to ensuring a dying person's comfort.^{1,2}



What are the advantages of syringe pumps?

Syringe pumps are:

- Portable
- Suitable for all clinical settings
- Pre-set to deliver medicines over a fixed time period
- Able to provide a constant level of medicine, ensuring that the plasma concentration remains at the optimum therapeutic level with no peaks or troughs
- More acceptable to the person being cared for than intramuscular or intravenous routes
- Flexible and can be used intermittently or discontinued if symptoms can later be managed by the oral route
- Protected by an external lockbox for syringes up to 30 mL.¹

What are the main indications for use of syringe pumps?

Syringe pumps are used when the administration of oral medicines is inappropriate or likely to be ineffective, e.g. if the person has:

- Persistent nausea and vomiting
- Dysphagia
- Gastrointestinal obstruction
- Poor absorption of oral medicines
- Weakness and/or alteration in the level of consciousness.

About the NIKI T34™, T34™ and BodyGuard™ T syringe pumps

The NIKI T34™ is one type of syringe pump that is used widely in Australia. It has a proven record of safety and reliability. This handbook relates to the NIKI T34™, T34™ and BodyGuard™ T, which are very similar in function and look. This handbook also includes some information about the BodyGuard™ T syringe pump, which is the next generation of the NIKI T34™.

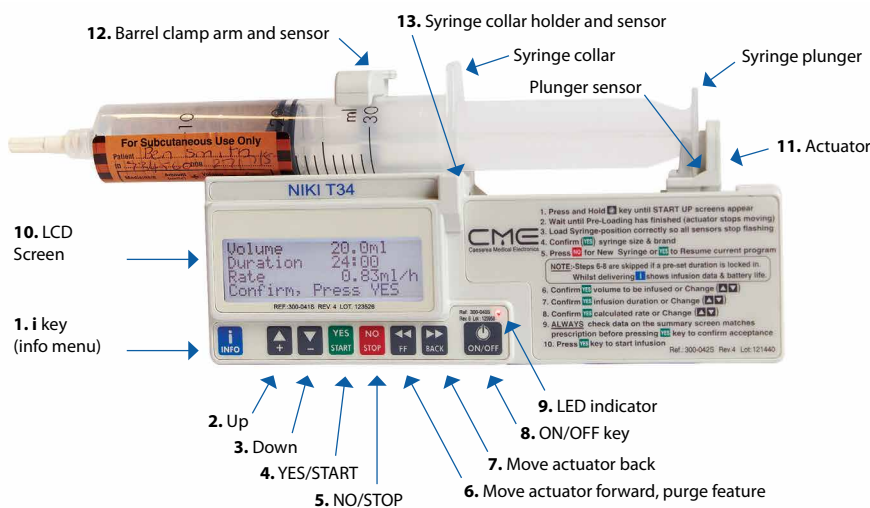
Safety features

Safety features include:

- Lockout features to ensure that unintended key presses do not occur:
 - The NIKI T34™ syringe pump is contained within a lockbox that only a health professional can open.
 - The keypad has a locking feature that prevents turning off the pump unintentionally.
- Alarms that sound if something is not right with the pump e.g. the battery has run out.

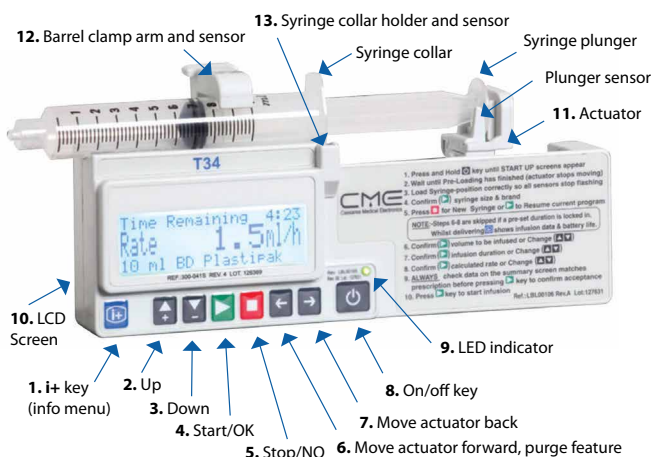
NIKI T34™ (2nd edition)

Front of pump: keys and display screen



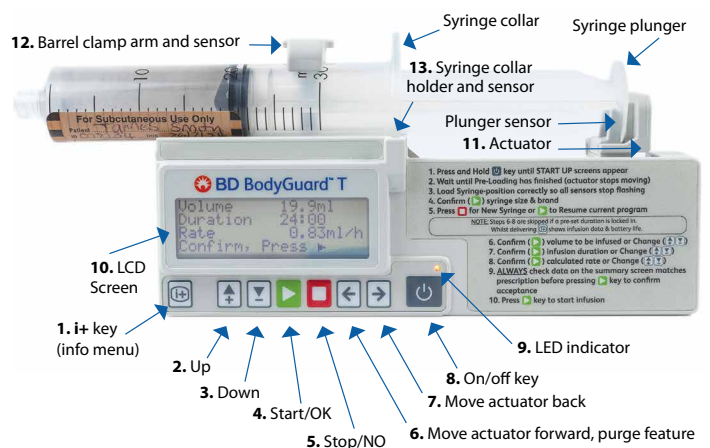
T34™ (3rd edition)

Front of pump: keys and display screen



























BodyGuard™ T

Front of pump: keys and display screen



* See table over page for more information.

The NIKI T34™, T34™ and BodyGuard™ T syringe pump features

| No. | NIKI T34™ | T34™ | BodyGuard™ T | Function |
|-----|---|---|---|--|
| 1. |  |  |  | <ul style="list-style-type: none"> repeated presses during infusion will display infusion summary and battery level when pump paused, accesses the main (Info) menu long press activates/deactivates keypad lock |
| 2. |  |  |  | <ul style="list-style-type: none"> scrolls between options |
| 3. |  |  |  | <ul style="list-style-type: none"> scrolls between options |
| 4. |  |  |  | <ul style="list-style-type: none"> confirms selection starts infusion |
| 5. |  |  |  | <ul style="list-style-type: none"> stops infusion takes user back a step during programming |
| 6. |  |  |  | <ul style="list-style-type: none"> moves actuator forward when no syringe is in place and the barrel clamp arm is down accesses purge function scrolls between options |
| 7. |  |  |  | <ul style="list-style-type: none"> moves actuator backward when no syringe is in place and barrel clamp arm is down scrolls between options |
| 8. |  |  |  | <ul style="list-style-type: none"> powers the pump on and off |
| 9. | LED light | LED light | LED light | <p>A green indicator lights:</p> <ul style="list-style-type: none"> during system self-test intermittently (about every 30 seconds) to indicate infusion delivery <p>A red indicator lights:</p> <ul style="list-style-type: none"> continuously to indicate an alarm state when pump paused/on stand-by mode or stopped |
| 10. | LED screen | LED screen | LED screen | <ul style="list-style-type: none"> displays pump and infusion status, programming choices and instructions backlight enabled when any key pressed |
| 11. | The actuator | The actuator | The actuator | <ul style="list-style-type: none"> moves the syringe plunger and contains a plunger sensor |
| 12. | Barrel clamp arm | Barrel clamp arm | Barrel clamp arm | <ul style="list-style-type: none"> holds the syringe in place and contains a sensor |
| 13. | Syringe collar holder | Syringe collar holder | Syringe collar holder | <ul style="list-style-type: none"> holds the syringe collar in place and contains a sensor |

The actuator, barrel clamp arm and syringe collar holder all contain sensors that provide information to:

- Ensure the syringe is in the correct position
- Sense the type and size of the syringe
- Calculate the infusion rate.

NOTE: The NIKI T34™ syringe pump is pre-programmed to infuse solutions over 24 hours for palliative care patients. It calculates infusion rates, to the second decimal point, in mL/hour based on the exact volume in the syringe. Consequently, slight variations in syringe volumes will result in slight variations in infusion rates. With a syringe volume of approximately 20 mL, infusion rates will typically vary between 0.77 and 0.86 mL/hr.

Accessories

The following accessories are available for the NIKI T34™ syringe pump:

- Rigid lockbox (with key) suitable for all syringes up to 30 mL
- Carry pouch for pump and lockbox.



For more information, watch the video *Getting to know the NIKI T34™ syringe pump*, available at www.pallconsult.com.au

Using the NIKI T34™, T34™ and BodyGuard™ T syringe pumps

General safety management principles

- Medicine is prepared as per medicine orders specified by a medical practitioner or nurse practitioner
- It is recommended that diluent and medicine are drawn up to a volume of 20 mL
- In palliative care, the pre-programmed delivery period for a NIKI T34™ syringe pump is 24 hours
- To ensure consistency, standardisation and safety, Luer lock syringes and extension sets must be used to prevent accidental disconnection of the extension set tubing from the syringe
- The pump and labelled syringe should be accommodated in a lockbox when in use
- It is not recommended to mix more than three medicines in a syringe pump, unless on the advice of a palliative medicine specialist.

Medicines and compatibility in a syringe pump

Medicines used together in a syringe pump should be checked for compatibility. Avoid mixing medicines in one syringe if compatibility data is not available.

Medicine combinations may be compatible only at certain concentrations, therefore the concentration of each medicine in the syringe should be compared with compatibility data, not the dose to be delivered.

Ensure that the diluent is compatible with each of the medicines.

Check the solution in the syringe regularly for precipitation and/or discolouration and discard the contents if this happens.

Check medicine compatibility using the [Safer Care Victoria Syringe Driver Compatibility guidance document](#)⁽⁴⁾

Syringe volumes and diluent

Syringe volumes

There is no definitive, high-level evidence to indicate how much diluent should be used. However, it is consensus-based best practice to make the solution as dilute as possible to reduce the likelihood of medicine incompatibility and to minimise site irritation. A combined volume of 20 mL (diluent plus medicine) is recommended.

Some medicine may cause irritation at the subcutaneous site.² If there is doubt about appropriate syringe contents, check with a palliative medicine specialist, a pharmacist or the clinical supervisor/manager.

Diluents

In Australia, sterile sodium chloride 0.9% is the first choice of diluent, however with some medicines, sterile water is the recommended choice. If there is a doubt, check with a pharmacist or an evidence-based compatibility guide.

Labelling the syringe

The following details are required on the label:

- Patient name
- ID number
- Date of birth
- Medicine added
- Units/mL of medicine added
- Diluent added
- Date
- Time
- Initials of the health professional who prepared the syringe
- Initials of the health professional who checked the syringe



The battery

Choosing the correct battery

NOTE: changes from the usual battery brand may be required when using a T34™ or BodyGuard™T syringe pump.

NIKI T34™ – Always use a 9V alkaline disposable battery. Any good quality brand is acceptable.

T34™ and BodyGuard™T – Use 9V alkaline disposable battery with IEC code 6LR61. Both WINC premium alkaline 9V battery and Battery World ultra-alkaline generic batteries meet this requirement. The battery should have the **6LR61** code printed on the casing.





Using the incorrect battery can cause a number of issues including *end of battery* messages during pre-loading, volume test fails, pressure test/calibration issues and reduced amount of infusions from the battery.



NOTE: In the T34™ and the BodyGuard™T the battery life is approximately 50 hours.

Backup battery depletion (T34™ and BodyGuard™T only)

If the internal backup battery has been depleted, the pump displays an alarm and requires you to enter the current date and time by following the directions on the screen.

Press  or  to change date and time settings. To move to next screen press  or  to go back to the previous step.







Fitting the battery

1. Slide open the compartment cover at the back of the syringe pump
2. Push the battery into the compartment taking care to ensure that the +/- contacts are aligned as shown on the label inside the compartment
3. Slide the cover back on.







** When changing the battery during an infusion, stop the infusion and turn off the syringe pump before removing the battery.*












Testing the battery

Prior to setting up a syringe pump, always check that there is adequate charge in the battery.

1. Press   
2. Select **BATTERY LEVEL** from the menu and press   
3. Verify sufficient battery charge is available (approximately 30% for NIKI T34™ and 50% for T34™ and BodyGuard™ T.)
4. Change the battery if not sufficient.



Changing the battery mid infusion

1. Unlock the keypad, if applicable
2. Stop the infusion by pressing   
3. Turn the syringe pump off by holding down   
4. Replace the battery

5. Power up the syringe pump by pressing   
6. Press   to confirm syringe brand and size
7. Screen: Press   to Resume or   for New Program
8. Press   * to resume

*** If you press NO the syringe pump interprets this as a completely new 24-hour period. You will need to prepare a new syringe of medicine and start the infusion again.**

Press   to confirm **Volume, Duration and Rate**

Press   to re-commence infusion.

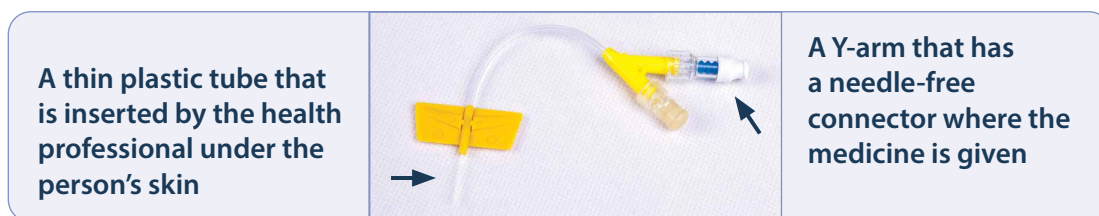


The subcutaneous cannula

What is a subcutaneous cannula?

A subcutaneous cannula is a device that allows medicine to be delivered continuously under the skin avoiding the need for recurrent injections. The medicine is then absorbed into the body via the small blood vessels in the fatty layer of the skin.

Each cannula has two ends, as shown in the picture.



Selecting a site for subcutaneous cannula insertion

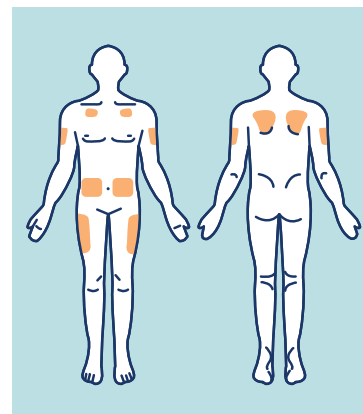
The common sites for subcutaneous cannula insertion are shown in the image.

Consider the following when selecting a site:

- Site preference of the person
- The availability of subcutaneous tissue, patient mobility and pressure care needs
- Avoid bony prominences, areas of broken skin or infection, recently irradiated areas, tumour sites, skin folds, scarred areas, joint proximity, areas of poor circulation, ascites, oedema and lymphoedema, or areas of compromised lymph drainage (e.g. mastectomy).

Care of the subcutaneous site

- Assess the infusion site every four hours in an inpatient facility and daily in community settings
- Only change subcutaneous sites when required e.g. if red, hard, swollen, bleeding, leaking or painful as these factors hinder absorption.



Inserting a subcutaneous cannula: A step-by-step guide

PLEASE NOTE: This step-by-step guide was specifically produced for non-paid carers looking after a person who has chosen to be cared for, and to die at home, if possible. For resolution of detail in the photographs no personal protective equipment (PPE) was worn. Please follow the local policy and procedures regarding the insertion of a subcutaneous cannula and wearing of PPE.

More information is available from www.caringathomeproject.com.au

STEP 1

Wash hands with soap and water and dry them well



STEP 2

Collect the following items:

- A clean plastic container to put equipment in
- A subcutaneous cannula
- A transparent waterproof dressing
- An alcohol wipe or similar
- A smart-valve connector
- A sharps container
- A rubbish bag or bin



STEP 3

Prepare the cannula

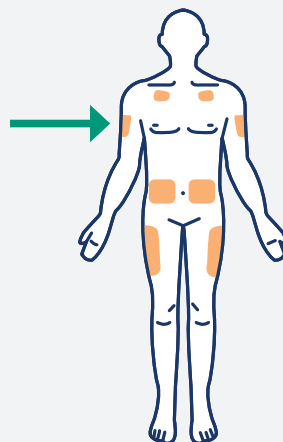
- Open the cannula packet keeping it in its clear case
 - Remove the white slide clamp
 - Rotate the safety shield tube 360 degrees clockwise to make sure that the needle moves freely in its protective plastic cover
 - Remove the plastic vent port from the Y-arm
 - Open the smart-valve connector packet, remove the clear plug and screw the connector onto the Y-arm until it is tight
 - Place the cannula into the plastic container
- Open the transparent waterproof dressing packaging and place the dressing in the plastic container
- Put the alcohol wipe in the plastic container



STEP 4

Prepare to insert the cannula

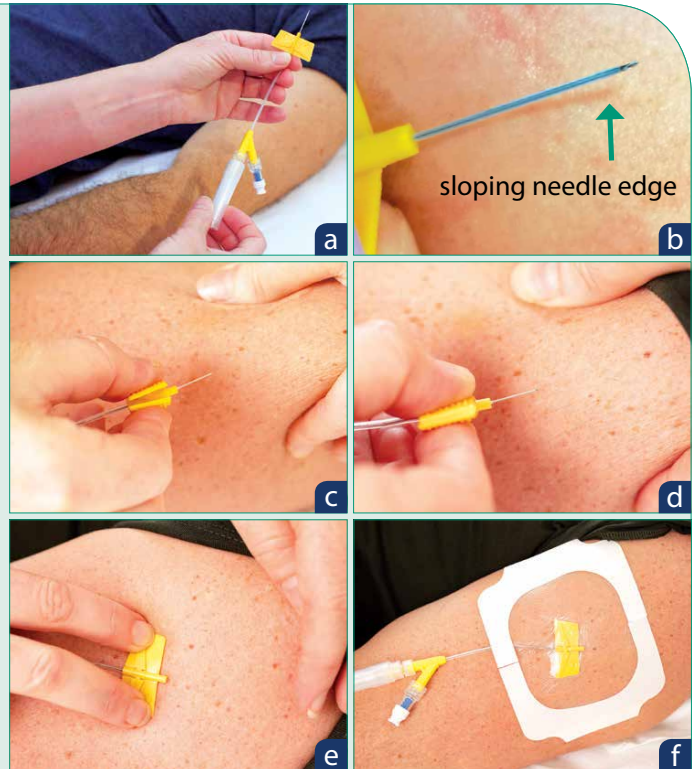
- Select a site to insert the cannula
- Use the alcohol wipe to clean the skin



STEP 5

Insert the cannula

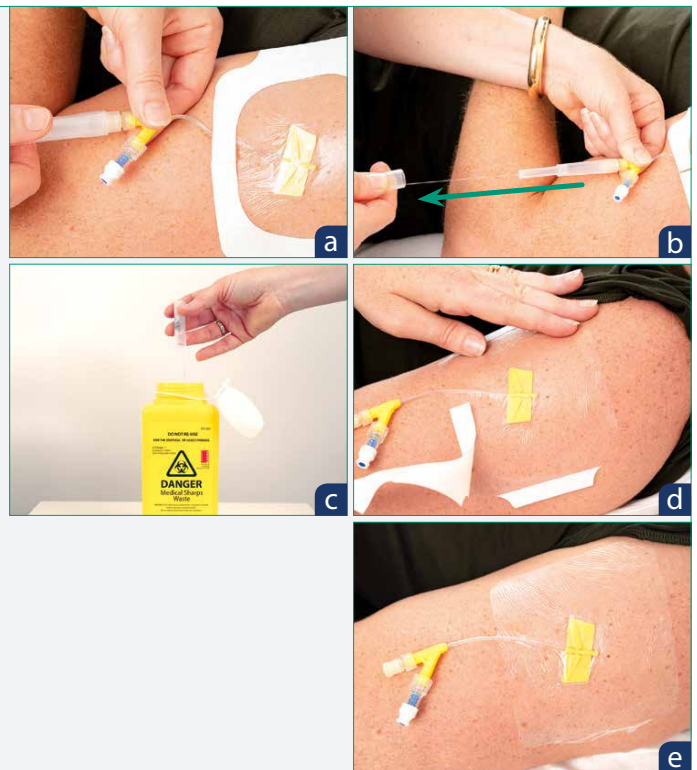
- Peel the printed backing off the transparent waterproof dressing and leave it sticky side up
- Remove the protective plastic cover from the cannula needle and plastic tubing (a)
- Use the white safety shield to rotate the needle so that the sloping edge is on top (b)
- Gently gather the person's skin between your thumb and fingers and hold it firmly (c)
- Using your other hand, lift the edges of the yellow wings of the cannula so that the raised triangles on the wings come together (c)
- Hold the wings together and push the needle and plastic tubing into the skin, at a 45-degree angle until the whole needle is under the skin (d)
- Flatten the yellow wings against the person's skin (e)
- Stick the transparent dressing over the needle entry site, making sure that it also covers the flattened yellow wings of the cannula. **This is important to hold the cannula in place.** (f)



STEP 6

Set up the cannula

- Hold the yellow Y-arm firmly in one hand. **This is important, otherwise you may pull the plastic tubing out of the person, instead of just the needle.** (a)
- With your other hand, pull back in a **straight continuous motion** on the loosened white safety shield until the safety shield and needle separates from the cannula (b)
- Discard the safety shield with its needle into the sharps container (c)
- Remove the white backing, if present, from the outer edge of the dressing and smooth the edges onto the person's skin (d)
- Check the needle entry site to ensure the plastic tubing has stayed under the skin (e)
- Write the insertion date on the waterproof dressing.



Setting up and commencing a NIKI T34™, T34™ and BodyGuard™ T syringe pump infusion with a new syringe: A step-by-step guide

- This guide assumes that a subcutaneous cannula has already been inserted into the person.
- All volumes and rates shown in this step-by-step guide are examples only.
- This guide is relevant for use with a NIKI T34™, T34™ or BodyGuard™ T syringe pump. Relevant keys for each pump are included.

NOTE: The NIKI T34™, T34™ and BodyGuard™ T syringe pumps are pre-programmed to infuse solutions over 24 hours for palliative care patients. The pumps calculate infusion rates, to the second decimal point, in mL/hour based on the exact volume in the syringe. Consequently, slight variations in syringe volumes will result in slight variations in infusion rates. With a syringe volume of approximately 20 mL, infusion rates will typically vary between 0.77 and 0.86 mL/hr.

Equipment

- The NIKI T34™, T34™ or the BodyGuard™ T syringe pump
- A 9-volt alkaline disposable battery, inserted into the syringe pump. For T34™ and BodyGuard™ T, use a 6LR61 battery (see the Handbook for more detailed information)
- A 30 mL Luer lock syringe
- A 'Medicines added' label
- The medicines order from the prescriber
- Medicine ampoules
- Alcohol wipe
- Diluent
- Blunt drawing up needle
- An extension set
- Sharps container
- Personal protective equipment (PPE) as required by local policy and procedures
- The lockbox for the syringe pump
- A pouch or holster for the syringe pump



NIKI T34™



BodyGuard™ T



Procedure

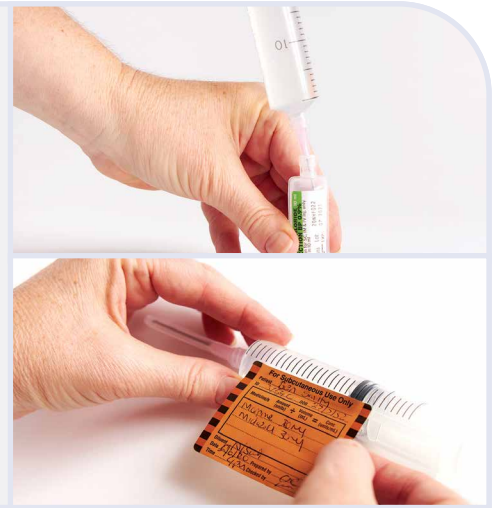
1. Wash hands
2. Complete a 'Medicines added' label



3. Prepare the syringe for loading

- Attach the blunt drawing up needle and draw up medicine, as prescribed, into the 30 mL Luer lock syringe
- Fill the syringe to 20 mL (combined volume of medicines and diluent [if required])
- Label the syringe clearly with completed 'Medicines added' label
- Ensure the label is flat and does not interfere with the barrel clamp or obscure the volume measurement gradient
- Recap needle

*** CAUTION DO NOT** attach extension set to the subcutaneous cannula yet.



4. Turn on the syringe pump

- Press  







* wait for the actuator to complete its automatic movement sequence

** In BodyGuard™ T only: if the syringe pump has not been used for several weeks, you may be prompted to reset the date and time before pump will pre-load.

Follow the on-screen prompts, then press (green play symbol)

- Screen: **PRE-LOADING** until actuator stops







- Screen: **LOAD SYRINGE**

- Using the syringe as a guide, adjust the position of the actuator **after** it stops moving by pressing either    or    to align syringe collar to the collar sensor and the plunger sensor to the syringe plunger






*** CAUTION DO NOT** use force to try to move the actuator manually as this could damage the device.

5. Load the syringe

- Lift the barrel clamp arm gently as far as it goes, turn the arm 180° and slowly lower it to the down position
- Load the syringe into the pump ensuring the syringe collar is sitting vertically in the collar sensor and the syringe plunger is centred in the plunger sensor
- Lift and turn the barrel clamp arm to hold the syringe in place
- Check the position of the syringe in the three sensors to ensure the syringe has remained in position
- Select the syringe brand using    keys, then press    when the correct brand is displayed



6. Review infusion settings

- Check and review data on screen: **Volume, Duration, Rate** (e.g. 20 mL, 24 hrs, 0.84 mL/hr)
- Confirm settings by pressing   

*** CAUTION DO NOT** commence infusion as the extension set must be primed first (see Step 8).

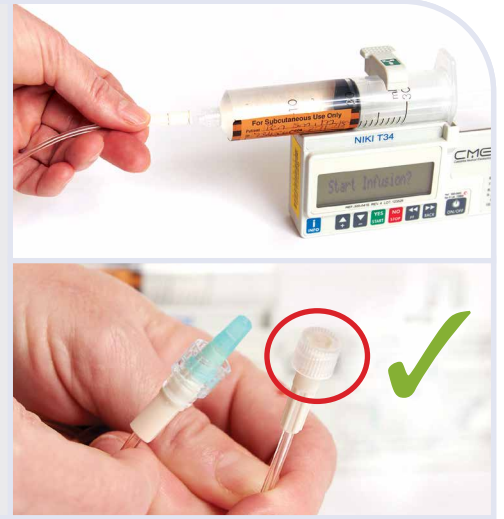
*** NOTE:** The NIKI T34™ syringe pump is pre-programmed to infuse the syringe contents over 24 hours.

- Screen: **START INFUSION?**



7. Attach the extension set

- Remove the drawing up needle and place it in the sharps container
- Screw the extension set onto the end of the syringe
- * **Only one end of the extension set can correctly connect to the syringe, as shown.**



8. Prime extension set tubing

- Press **FF** **←** **←** key
- Screen: **PURGE. DISCONNECT PATIENT**
- Confirm by pressing **YES** **▶** **▶**
- Prime the extension set tubing by pressing and holding **FF** **←** **←** until approximately 2 mL of fluid goes into the tubing and some drops of fluid come out of the other end of the extension set

Screen: **PURGE COMPLETED**

- * **If you use less than 2 mL volume to purge, the PURGE COMPLETED screen will not display. This is OK as long as drops of fluid come out of the other end of the set.**
- * **Because you have primed the extension set with approximately 2 mL of volume, the pump will not run for a full 24 hours. It will finish approximately two hours early. This will only occur on day 1 of the infusion. On subsequent days, the pump will run for the full 24 hours.**

* **NOTE:** On subsequent days, the extension set will not need to be primed.





9. Reconfirm syringe brand

- Re-select correct brand of syringe
- Press **YES** **▶** **▶** to resume





10. Confirm revised infusion data after priming

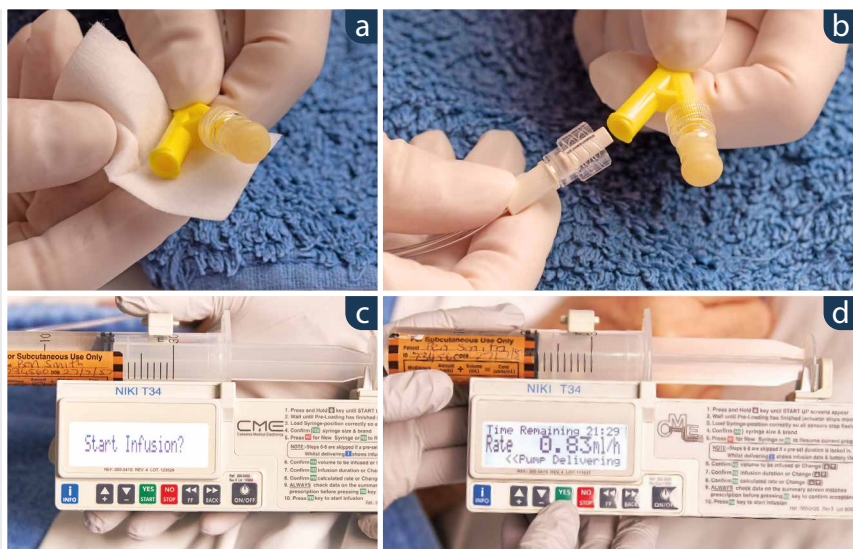
- Screen: **VOLUME (e.g. 18 mL)**
DURATION (e.g. 21.30hrs)
Rate will remain constant (e.g. 0.84 mL/hr)
- Check that all information on the summary screen is correct and matches the medicines order
- Confirm by pressing **YES START**  
- Screen: **START INFUSION?**



11. Take the pump to the person's bedside.

Wash hands again and don PPE as required













- Use an alcohol wipe to swab the end of the subcutaneous cannula
 - Remove the cap from the end of the extension set and connect it to the subcutaneous cannula
 - Screen: **START INFUSION?**
 - Press **YES START**  
- The pump will now begin delivering the medicine to the person.

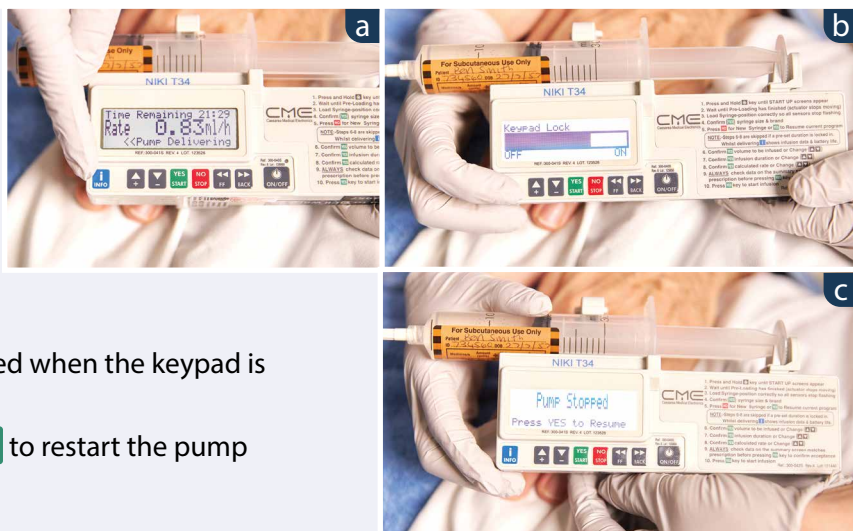


Screen during infusion

- Whilst infusing, the screen shows key infusion parameters including: Time remaining of infusion, infusion rate and syringe brand and size
- The delivery of medicine is indicated by a message on the display **'<<<Pump Delivering'** and a green LED light on the keypad that flashes approximately once every 30 seconds

12. Activate the keypad lock

- Press and hold **INFO**    until a bar is displayed moving from left to right
 - Hold **INFO**    down until the bar has moved completely across the screen and a beep sounds to confirm the lock has been activated
 - For safety, **NO STOP**   can still be activated when the keypad is in locked mode
- * If you press **NO STOP**  , press **YES START**   to restart the pump again if required.



13. Place the syringe pump in the lockbox, lock it with the key and then place it in a pouch or holster if needed









14. Complete documentation according to local policy and procedures



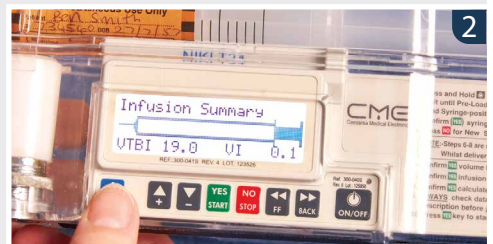
15. Monitor the infusion and pump over time

This step is completed while the syringe is in the lockbox.

At regular intervals:

1. Check the screen to confirm:
 - the syringe pump is still running at the same infusion rate as originally set
 - Check the screen is intermittently showing the **<<< Pump delivering** and syringe information animation
 - Check for signs of physical damage to the syringe pump and accessories
2. Press    once to check Volume to Be Infused (VTBI) and Volume Infused (VI). The syringe graphic shows VTBI and VI in graphical form
3. Press    twice to check for battery life remaining shown as a percentage and in graphical form on the screen.

*** The syringe pump will alert/alarm to indicate if there is a need to replace the battery.**



Subsequent infusions

a. When a syringe is nearly empty




The pump will sound an alert 15 minutes and 7 minutes and before the syringe will be empty


Screen: **Program Nearly Complete**



b. When a syringe has emptied




The syringe pump will stop automatically when the syringe is empty, and an alarm will sound.

1. Turn keypad lock off.
Hold    down until the bar has moved completely across the screen and a beep sounds to confirm the lock has been deactivated
2. Screen: **End Program PRESS 'YES' to confirm**

Press   



Continued over page...

3. Press and hold    to turn the pump off

– Unlock the lockbox and remove the pump

4. Remove the empty syringe from the pump with the extension set attached

– Turn the syringe pump on by holding   

5. Load a new filled and labelled syringe into the pump.

*** CAUTION DO NOT start the infusion yet.**



6. Remove the blunt drawing up needle and safely discard it in the sharps container

7. Disconnect the extension set from the empty syringe and attach it to the new syringe loaded in the syringe pump

*** NOTE:** This infusion will now run for 24 hours because the extension set is already primed.

8. Press    to start the infusion

9. Once running, lock the keypad, put the syringe pump in the lockbox and lock it

– Discard the empty syringe and any rubbish

*** NOTE:** If the prescriber has changed the medicines order, then the extension set and the syringe may need to be discarded. Set up a new syringe and extension set as per the start of this step-by-step guide.



For more information and educational resources about the NIKI T34™, T34™ and BodyGuard™ T syringe pump, visit: PallConsult.com.au

Documentation

For patient comfort and safety, documentation must always accompany the use of NIKI T34™ syringe pump infusions.

Documentation will vary according to clinical setting and each local service's policy and procedures.

Organisations may use their own documentation, or a Queensland Health-approved form can be downloaded from pallconsult.com.au for:

- Community, Residential Aged Care Facilities and non-digital hospitals
Form – NIKI T34™ [subcutaneous medication infusion chart](#). (Queensland Health Intranet only)
- Form – NIKI T34™ [subcutaneous medication infusion chart](#). (Non-Queensland health organisations)











For hospitals using electronic records; the Medication Administration Record (MAR):






- Please refer to your local digital health team for site-specific training resources on ordering and documenting subcutaneous infusions.

Alerts and alarms










Alerts – an alarm will sound intermittently, the infusion will continue and a message will appear on the display screen indicating the cause. This message then alternates with the **Infusion Running** screen.




Alarms – an alarm will sound continuously, the infusion will stop, the LED light turns red, and a message appears on the screen indicating the cause.

| Screen | Description | Implication/Action |
|---|---|---|
| Press YES to resume NO for new syringe | Alarm: Something has occurred which has interrupted the current program (e.g. syringe displaced /battery failure) so the device is prompting the user to check the pump. | Pressing   will continue the current, interrupted infusion. Check/confirm infusion summary screens and press   to restart current infusion. Pressing   will program a new infusion, e.g. new syringe. The pump will calculate the volume of the syringe and, based on duration required, will start a new program. |
| Pump paused too long | If the device is left idle in set up mode for more than two minutes, an alarm will sound. | Press   to return to the screen you were on. |
| Pump paused too long | Alarm: Pump has been left in   mode (on hold) for 2 minutes. | Either restart the infusion, continue pause or turn the pump off. |
| Low battery | Alert: Battery is almost depleted. | Prepare to change battery. |
| Program nearly complete | Alert: Infusion will end soon. | Prepare to change syringe or turn pump off. |
| End battery | Alarm: Battery is depleted. | Change battery. |







| | | |
|---|--|---|
| End program | Alarm: Infusion is complete. | Close down or start new infusion. |
| Check syringe loaded correctly | Alarm: One or more of the syringe detection sensors is not detecting the correct placement of syringe. | Check the syringe and realign it as necessary. |
| Occlusion/ syringe empty Check line & syringe Press YES to confirm | Alarm: • Patient access device blocked • Clamp on the infusion line • Tubing occluded • Pump has reached the minimum travel position. | <ul style="list-style-type: none"> • Flush or replace device • Release the clamp • Clear the occlusion • Turn pump off. |
| System error. Press and hold INFO for details. If problem persists send pump for service | Alarm: System error. | Pressing    will display the reason for the alarm and give advice if applicable. If correction not possible: <ul style="list-style-type: none"> • Remove pump from use and turn power off • Follow your local policy and procedures to return the pump for servicing • Include an explanatory note of the error code, and a brief description of the problem. |
| For BodyGuard™ T only Time & Date incorrect date/time Press  to restore | The internal backup battery has been depleted and date/time values have been reset. | Press  , then enter current date and time. |

Keypad lock

Whilst the syringe pump is infusing, all of the keys on the NIKI T34™ syringe pump keypad are inactive except:    ,  
 ,   







The NIKI T34™ syringe pump allows all users to apply an additional keypad lock which inactivates the    key. This prevents the pump from being inadvertently turned off.

To activate the keypad lock:

1. With the pump infusing, press and hold    until a chart is displayed showing a bar moving from left to right.
2. Hold    down until the bar has moved completely across the screen and a beep is heard to confirm the lock has been activated.



To deactivate the keypad lock:

1. Press and hold    until the display shows a bar moving from right to left
2. Hold    down until the bar has moved completely across the screen and a beep is heard to confirm the lock has been deactivated.

* **The keypad lock does not affect the operation of the    and    keys.**

Using the lockbox

1. The NIKI T34™ syringe pump lockbox accommodates syringes up to 30 mL
2. Open the lockbox using the standard key that operates all NIKI T34™ syringe pump lockboxes
3. Place the pump into the lockbox so that the screen and keypad line up with the cut-out opening
4. Close the lockbox, guiding the extension set out of the slot at the front. Squeeze gently, if necessary, to ensure the lockbox closes securely
5. Lock the box using the key.

* **The lockbox prevents tampering with the syringe. The battery can be replaced without removing the syringe pump from the lockbox.**

Educating patients and their families

Using the principles of adult education, the person and their family require education about:

- Why a syringe pump is used
- What the syringe pump does
- How they should care for the syringe pump and the cannula insertion site
- How to seek assistance if an alarm sounds
- How to protect the pump from water splashes when a person is showering/bathing, such as wrapping the pump in a plastic bag.

The education needs to be tailored to the individuals and their circumstances. Provide relevant information according to local policy and procedures.

PallConsult has developed an *Information Sheet for families* that can be used to educate patients and their families. Visit pallconsult.com.au for more information.



Cleaning

- Always turn the pump off and remove the battery before cleaning
- Clean the device using a lint-free cloth lightly dampened with warm water and a mild detergent, disinfectant or 10% bleach solution
- In the community, once a month (or as required) clean the lead screw thread (beneath the actuator) and guiding rods with a small dry brush to remove debris or other particles. In hospitals, the local equipment area will undertake cleaning.

CAUTION

DO NOT clean the pump with chemicals such as xylene, acetone or similar solvents.

DO NOT soak or immerse any part of the NIKI T34™ syringe pump in water or any other solution. The NIKI T34™ is NOT waterproof.

Servicing and maintenance

- A maintenance service of the NIKI T34™ syringe pump is recommended every year, as per the manufacturer's guidelines. A maintenance reminder alert will display on the machine when the yearly service is due.
- Servicing should be attended by a BD certified technician who will perform the following procedures:
 - Clean the syringe pump thoroughly
 - Visually inspect the syringe pump to verify its structural integrity
 - Perform all the manual tests in the change set up menu
 - Perform calibration procedures as per the technical service manual
 - Run the syringe pump for several hours to make sure no abnormalities occur during infusion such as alarms, inaccurate infusion and battery inconsistencies.

Pump storage

Store in a clean, dry place at room temperature. If the syringe pump is stored for an extended period, it should be cleaned, and the battery removed.

References

1. Centre for Palliative Care Research and Education 2021. *Guidelines for Subcutaneous Infusion Device Management in Palliative Care*. Third Edition, Queensland Health, Herston, QLD
2. Dickman, A., Schneider, J., & Varga, J., 2016. *The Syringe Driver. Continuous Subcutaneous infusions in Palliative Care*. Third Edition. Oxford University Press, Oxford UK.
3. Caesarea Medical Electronics Ltd. Caesarea 3088900, Israel
4. Safer Care Victoria. February 2021. *Syringe driver compatibility guidance document*. Available from: https://www.bettersafecare.vic.gov.au/sites/default/files/2021-02/GUIDANCE_Syringe%20driver%20compatibility%20FINAL_0.pdf (Accessed 10 June 2021)

Notes

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