NHS

Leeds Community Healthcare

Clinical Guideline for the Safe Use of the McKinley T34 Syringe Driver in Children's Services	
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Contents

1. Purpose

This guideline will support staff working with children in the safe administration of medication via the McKinley T34 syringe driver and promote standardised practice across the regions.

Syringe drivers are used for the continuous delivery of drugs into the subcutaneous tissue or central line device of children for whom oral administration would be problematic. They are used to control symptoms in the care of children with terminal illnesses and/or palliative care needs in both home and hospital/hospice settings. The effective use of syringe drivers can enhance quality of life and enable children to be treated in their home, or other community settings, in comfort and with their symptoms well controlled.

Adapted

This guideline has been adapted from the Clinical Guideline for the Safe Use of the McKinley T34 Syringe Driver in Adult Services (2010). Thank you to Angela Gregson for her consent to use these guidelines, and to Karen Heaton for her adaptation for use by Children's Services.

Background

Following a pilot involving LCH, Leeds Teaching Hospitals Trust, (LTHT), and St. Gemma's and Wheatfields Hospices it was agreed that The Children's' Macmillan Team based at The Leeds Children's Hospital would use the McKinley T34. This change is in response to recommendations from the Medicines and Healthcare products Regulatory Agency (MHRA 2003) that organisations should consider alternatives to the use of Graseby models which no longer meet national safety requirements. The McKinley T34 meets safety standards issued by the International Electro-technical Commission (IEC) that have been adopted as British standards (IEC 60601-2-24).

Graseby models will be withdrawn from use and must not be used under any circumstance.

2. Scope

This guideline is for nurses employed within Children's Services, with a valid NMC registration and working within the NMC Code - Standards of conduct , performance and ethics for nurses and midwives (May 2008), Standards for Medicines Management (NMC 2008) and the Record Keeping: Guidance for Nurses and Midwives (NMC 2009).

The McKinley T34 syringe driver may be used to administer medication subcutaneously or via a central line to children who are being cared for in their own homes or community setting and who require control of symptoms and are unable to swallow and/or absorb medication or receive the required medication by any other route

These guidelines must be used in conjunction with:

- LTH Policy for Management of Medical Devices Policy (2009)
- LTH Waste Management and Disposal Policy (2008)
- LTH Hand Hygiene Policy (2009)
- LTH Policy for Consent to Examination or Treatment (2009)
- LTH Controlled Drugs Policy (2009)

- LTH Medicines Code (2008)
- LTH Handling and Use of Medicines Procedure (HUMP) Procedure for Administration of Medicines and Medical Appliances (2009)
- LTH Handling and Use of Medicines Procedure (HUMP) Procedure for Disposal of Medicines & Medical Appliances (2009)
- LTH Incident Management Policy and Guidance (2010)

3. Equality Impact Assessment (EIA)

An Equality Impact initial screening assessment has been completed which indicated no need for further assessment (Appendix 1).

4. Mental Capacity Act (MCA 2005 Code of Practice)

This Act mainly applies to all Trust employees who provide care and/or treatment to persons over the age of 18 who are judged to lack capacity to consent or withhold consent to acts which are considered by health and social care professionals to be in the best interest of their welfare and health. However, some parts of the Act affect children under the age of 16 and also young people under the ages of 16 and 18.

Children Under 16

The Act does not generally apply to children under the age of 16 except

(i) when the Court of Protection is involved over decisions regarding property and affairs where the decision(s) may extend beyond the child attaining the age of 18 and

(ii) Offences of ill treatment or wilful neglect o a person who lacks capacity can also apply to victims younger then 16 (section 44)

The Children Act 1989 usually applies in most cases.

Young People aged 16-17 years

Most of the Mental Capacity Act applies to young people aged 16-18 years who may lack the capacity to make specific decisions, however there are three exceptions:

- Only people aged 18 and over may make a lasting power of attorney
- Only people aged 18 and over can make advanced decisions about refusing treatment
- The Court of Protection may only make a statutory will for a person aged 18 or over

This guidance in the Mental Capacity Act 2005 Code of Practice is designed specifically to assist carers, health and social care practitioners in the assessment of mental capacity and, where necessary, making decisions on behalf of individuals who lack capacity, in their best interests. Detailed guidance is available in the Mental Capacity Act 2005 Code of Practice: http://www.dca.gov.uk/legal-policy/mental-capacity/mca-cp.pdf).

5. Objectives

- To ensure that the use of the McKinley T34 is safe and effective.
- To ensure that practice is based on evidence
- To ensure that staff are trained to a desired level of competence.

6. Client Group Inclusion

Children and young people who require control of symptoms and are unable to swallow and/or absorb medication or receive the required medication by any other route and have been assessed by a Paediatrician or the Regional Children's Palliative Care Consultant, very rarely a GP who has worked closely with the family may suggest the use of a syringe driver.

7. Client Group Exclusion

Children and young people who have not been assessed by the Consultant Paediatrician or the Regional Children's Palliative Care Consultant or the GP as above.

8. Training

- Employers are responsible for ensuring that all staff using medical devices are appropriately trained (LTHT Medical Devices Policy, section 22.2, 22.3). All health care professionals and support workers have a personal responsibility and accountability to ensure they receive training in the safe use/observation of any medical devices they need to use. (NPSA 2004)
- Initial training to implement the McKinley T34 will be delivered to all registered practitioners who use syringe drivers in their work with children.
  Following this period, LTHT designated trainers will provide training to any registered practitioner who requires it.
  All staff must have had face to face training prior to using the McKinley T34.
- Competence using the McKinley T34 will be evidenced using the WASP competency framework (see Appendix 2) which practitioners should keep as evidence of learning.
- Staff will need to undertake refresher training two yearly via e-learning.
- Consideration is also being given to developing basic awareness training for non registered staff.

It is the responsibility of each practitioner to access training as detailed above.

It is the responsibility of managers to ensure that relevant practitioners attend training as detailed above.

Training activity will be captured in the Oracle Learning management System (OLM) and compliance reports produced as needed.

9. Indications for use of a syringe driver

The syringe driver is used to deliver drugs at a predetermined rate over a 24 hour period in mls/hour. The pumps are set at a default of 24 hours (lock off), although this can be changed to accommodate a 12hr infusion if required. It is unlikely that a 12hr infusion would be used with children and it would only be done following individual assessment and with a child specific plan in place to ensure the infusion could be changed out of hours.

The main indication to commence a syringe driver is the child's inability to swallow and /or absorb medications. This is most likely due to:

- Persistent nausea and vomiting
- Weakness or unconsciousness

- Malabsorption
- Inability to control symptoms any other way

The decision to administer medication via a syringe driver needs to be taken in partnership with the Children's Nurse, Paediatric Consultant/Children's Palliative Care Consultant/GP, Parent/Legal Guardian and child where applicable.

If a decision is made to use a syringe driver it must be remembered that it will take some time for medication to reach therapeutic levels, therefore a stat dose will need to be considered (Twycross et al 2002).

Consideration should also be given to the potential misuse of medicines. Such concerns may include:

- Known or suspected drug misuse within the family
- When a parent has expressed a wish to hasten death
- Presence of siblings in the child's home environment.

The McKinley T34 syringe driver is used with a lockable box which will help to minimise any risk related to the above.

10. Sites

Individual assessment must be undertaken to identify the most appropriate site.
This may include central lines (tunneled or non-tunneled) if already in situ. Care of the central line site must be undertaken following line specific guidelines and protocols. This tends to be the most common route of administration in children. If the child does not have a central line or the central line cannot be used for some reason then the subcutaneous route must be used with the following recommended sites for insertion of the appropriate cannulae:

- Anterior Chest Wall
- Anterior Aspect of Upper Arms (Avoid this site in children who are bed-bound and require regular turning)
- Anterior Abdominal Wall
- Anterior Aspect of Thighs

If using the subcutaneous site **avoid:**

- Bony prominences
- Recently irradiated skin sites
- Joints and skin folds
- Sites of tumour
- Areas of broken skin
- Areas of inflammation or infection
- Areas where other medication patches are in place
- Areas of lymphoedema or ascites, absorption will be restricted and breaches in skin integrity could increase risk of infection

If re-siting and there is a need to use same area, the needle must be at least 3cm away from the problem site.

11. Equipment and resources

Where possible, be two Registered Nurses should be present when setting up an infusion. At least one of the nurses must be fully competent in setting up the McKinley T34 Syringe Driver, however, a competent Children's Macmillan Nurse working as a lone worker On Call, can set up an infusion in an emergency situation.

- McKinley T34 Syringe Driver including lockable box
- 9v Duracell alkaline battery, plus spares
- Selection of syringes and needles for drawing up medications and Luer Lock Syringe (minimum 20ml)for loading onto driver.
- Infusion set (see 8.1 below) if using subcutaneous route
- Luer lock extension set if using central line
- Transparent, adhesive dressing.
- Valid Prescription/Medicines Administration Record (MAR) Chart
- Prescribed drugs.
- Appropriate diluents (water/saline)
- Sharps bin.
- Labels
- Documentation.

The McKinley T34 for use in Children's Services will be carried by On Call Specialist Nurse

11.1 Choice of cannulae

There are several cannulae available for use in Children's Services, LCH and a choice should be made taking into account the specific needs of the child.

- Soft-set, MiniMed 42" 106cm. To be inserted at 90 degree angle subcutaneously (remove needle introducer)

- Thalset infusion device. To be inserted at 90 degree angle subcutaneously (remove needle introducer)

- Insuflon winged infusion with 100cm tube at 45 degree angle

- McKinley giving set with 100cm tube at 45 degree angle

12. Drawing up medication

Best practice as advised by the Specialist Palliative Care teams is that **each prescribed medication should be drawn up separately** in order to ensure exact amounts of the medication. Manufacturers that produce the ampoules do not guarantee the amount of medication in each ampoule, only that the dosage is correct. The procedure is outlined at Appendix 3 and is included in training.

12.1 Syringes

Medication must be drawn up into a Luer lock syringe of suitable size. Luer lock syringes are recommended to prevent giving set and syringe separating or being pulled apart.

20ml, 30ml, and 50ml Luer lock syringes are recommended for use with the McKinley syringe pump. Fill capacity varies dependent on syringe type used – staff should refer to the McKinley T34 Operational Manual available at each base to check.

For children the most appropriate size of syringe for the amount of drug to be administered must be used. However where possible a 20ml syringe should be used for loading onto the syringe driver as it reduces irritation to site and risk of crystallization as more dilute and decreases risk of incompatibility and decrease risk of site rejection, (Dickman, Schneider and Varda, 2005). **However the lockable box will not lock with 50ml syringes so if the volume to be infused is greater than 30mls, two pumps must be used if possible**.

13 Drug compatibilities

As there is potential for interaction between drugs in a driver the compatibility of medications to be drawn up should be checked prior to mixing drugs. Information can be obtained from the BNF for Children, the http://www.rainbowhospice.org/life/care/pain.asp and The Syringe Driver - Continuous subcutaneous infusions in palliative care (2002). Mixing drugs that are not compatible can result in crystallisation, precipitation, syringe driver not working effectively, or loss of symptom control if one drug is denatured.
The resulting solution should be checked for any cloudiness or crystallisation. If this does occur **do not use** and obtain advice from the child's Consultant Paediatrician/GP, Regional Palliative Care Consultant for children or Children's Oncology Nurse Specialists as appropriate.

13.1 Prescribing

"Children are different from adults, their bodies respond differently from those of adults, and young children differently to older children. Thus detailed care and attention needs to be paid when making prescribing decisions for children and young people, taking into account their age, weight and developmental age" (National Service Framework 2004), BNF for Children (2009). Practitioners must check that medications have been legally prescribed before administration. If there are any concerns regarding the dose, side effects, or the appropriateness of the prescription, the practitioner must contact the prescriber, Children's Oncology Nurse Specialist, pharmacist or Medicines Management team before administering the medication. Practitioners must ensure that any previous oral or transdermal medications have been taken into consideration and any conversions reflected in the prescription for the syringe driver medications. If transdermal medication is in use when the syringe driver is commenced it should remain in place as prescribed.

Independent Nurse Prescribers (INPs) can now legally prescribe a mixture of licensed medication for administration via a syringe driver following legislative changes passed by government in December 2009. Due to the complexity of children's palliative care the Children's INPs would work in partnership with the Children's Regional Palliative Care Consultant or the individual child's Consultant Paediatrician or GP

14. Monitoring the infusion

The syringe driver should be checked to ensure it is running correctly at each visit or contact. (Appendix 4 outlines some common problems that may occur and potential solutions)

If using the subcutaneous site it must be checked for signs of redness, swelling, tenderness or leakage around the entry site and the infusion site should be renewed if these symptoms occur. If reactions occur consider the following:

- Type of medication and diluent, ensure correct diluent and solution
- Further dilution of the drug
- Change the infusion cannula to non-metallic type
- Change the type of site dressing

For central lines follow line specific guidelines and protocols.

Although it is anticipated that children with a syringe driver in situ will be receiving frequent visits from clinicians it is not necessary for clinicians to visit specifically to check the syringe driver more regularly than every 24hrs if the child/parent does not require more frequent visits. Clinicians should use their professional judgment to decide frequency of monitoring and visits and ensure, where appropriate, that the parents are advised on how to detect any problems with the syringe driver and given contact numbers for reporting these. If parents are monitoring the infusion they should be encouraged where possible to record their observations in the same way as clinicians would, paying particular attention to date and time. This will help to estimate potential loss of symptom control if the syringe driver stops infusing.

14.1 Battery life

Staff should be aware of the battery life projections when using the McKinley T34. At the start of a new battery, it will power at most, four full infusions. **For each new patient episode a new battery should be used.** At each consecutive visit, the battery level should be checked and documented.
At **30 – 35%**, CME McKinley cannot guarantee it will power a complete 24 hour infusion and therefore advise battery change at this point.

14.2 Monitoring the effectiveness of therapy

It is important that the effectiveness of symptom control is closely monitored and recorded. The nurse should reassess the child at each visit. If breakthrough pain or other symptoms occur the child should be offered additional medication in a suitable form, advice can be obtained from the Children's Regional Palliative Care Consultant, the individual child's Paediatrician or the Children's Oncology Nurse Specialists or if appropriate the GP. It is considered good practice for PRN doses to be prescribed for breakthrough pain at the same time as the daily dose. This enables the nurse to administer the medication without delay and reduce distress for the patient. If more than 2 PRN doses of the same drug are used in 24hours, the dose of that medication in the syringe driver should be reviewed and increased as per instruction. This action should not be delayed until the next time the syringe driver is due for changing if it is clear that the child's symptoms are not controlled on the current dose.

15. 12 hourly infusions

It is unlikely that a 12hr infusion would be used with children and it would only be done following individual assessment and with a child specific plan in place to ensure the infusion could be changed out of hours.

If the decision is made to use a 12 hourly infusion:

- **half the prescribed 24 hour doses of medications must be drawn up into the syringe driver.** The prescriber must still prescribe the medication for 24 hours as normal.
- programme the McKinley T34 to run a 12hr infusion
- clearly indicate on the syringe driver documentation in **RED** ink that the infusion is running over 12 hours and ensure that the dosage of medication required for 12 hours is transcribed accurately.
- PRN doses must be calculated as a sixth of the 24hr dose.
- If the line has to be re-sited (and therefore reprimed) during a 12 hr infusion, ensure that the new expected time of infusion completion is communicated to members of Children's Community Nursing Team and any other Specialist Nurses/clinicians who are involved in the care of the child.

16. Documentation

Good record keeping is the mark of a skilled and safe practitioner (NMC 2008). A clear, accurate and immediate record of all medication administered (NMC 2008) must be entered into the appropriate medication administration records within the child's patient held record, ensuring signatures are clear and legible (NMC 2008) and include the date and time that the infusion commenced and subsequently changed/discontinued.

Clinicians must utilize syringe driver documentation PM 3 (Appendix 5), in addition to a Medication Administration Record (MAR) and medication stock records PM 4&5 (Appendix 6 & 7), or whatever documentation is used in their local area. All staff must complete these documents accurately and clearly as required at each visit.
The adhesive label must be completed and applied to the loaded syringe documenting the contents of syringe and recording patient name, date, time and signature. Take care not to obscure the syringe scale with the label.
The rate setting at commencement of the infusion must be entered on the PM3 and on the syringe driver monitoring record.
At each consecutive visit, check the display on the pump - that it is delivering, infusion rate is as programmed (record), and record Volume to be Infused (VTBI).

Clinicians must clearly document on the syringe driver monitoring record each time they visit the child.

17. Parent/Carer Information

Parents/carers and if appropriate children, should have the following carefully explained whenever possible:

- How the McKinley T34 syringe pump works and why it is the preferred method of drug administration.

- The need to alert a member of staff if the syringe driver is not working properly, i.e., if the:
    - light changes from green to red
    - alarm sounds
    - needle becomes dislodged
    - needle site becomes painful
    - syringe driver is dropped or immersed in water

A patient information leaflet is currently being adapted for local use from the CME McKinley version and will be disseminated once agreed.

18. Incident reporting

If an incident occurs involving a McKinley T34 syringe driver, it must be reported immediately to the most senior practitioner/manager on duty and an IR1 must be completed on that same shift or as soon after the incident as possible. If required, the pump can be sent to Medical Physics for a report on events leading to the incident via the event log.

19. Cleaning the device

The provision of acceptably clean, well maintained equipment is essential to patient safety and comfort. It is the responsibility of the practitioner who discontinues the use of the driver to ensure that it is cleaned with non alcohol detergent wipes (Azo / Tuffie).

20. Maintenance and servicing of the device

Each McKinley T34 syringe driver must be acceptance tested prior to use and registered within the Medical Physics department situated within LTHT. Individual teams must ensure the driver is accurately entered onto the medical device equipment inventory. The syringe pumps are maintained by the medical physics service teams.

The McKinley T34 Syringe Pump will display the message '**Calibration Due send for service'** to inform the user that a service is due when the machine is switched on. It should be sent to Medical Physics for servicing and an alternative pump selected for patient use. **For this reason, the pump should be switched on prior to leaving base when commencing a syringe driver for the first time to ensure the pump is not due for service.** If the "Calibration Due" message is displayed during a patient episode, both CME McKinley and Medical Physics advise that it is acceptable to continue to use the pump if an alternative is not readily available. However, the pump should be replaced at the earliest opportunity and sent to Medical Physics via The Children's Macmillan Team.

Following service of the device, servicing information should be recorded on the service held inventory as outlined in the LTHT Medical Devices Policy.

21. Transfer/discharge home of a patient with a McKinley T34 in situ

If the infusion has been commenced by the Children's Oncology Macmillan Nurse Specialists and one of their pumps is in use it must be swapped to LCNT's as soon as possible and LTHT pump returned to the Children's Oncology Nurse Specialists. This must be documented in the patient held records.

22. Implementation

This guideline will be disseminated, following approval, via senior managers within Children's Services for distribution to appropriate staff. It will also be available on the i-net. Awareness and discussion of the guidelines will form part of formal training sessions.

23. Audit and Monitoring

Adherence to this guideline will be monitored through incident reporting within Children's Services, by the author and the Head of Service, Community Children's and Macmillan Nursing teams.

24. Procedure for the initiation, safe operation and monitoring of the McKinley T34 syringe pump

Action	→	Rationale
1. Where possible, there should be two Registered Nurses present when setting up an infusion. At least one of the nurses must be fully competent in setting up the McKinley T34 Syringe Driver	→	To reduce risk of error
2. Explain the need for commencing /continuing the use of the syringe driver with the parent/carer and where appropriate with the child	→	Parent/legal guardian consent is agreed following discussion and is documented in the child's care plan.
3. Assemble all materials and equipment as per LTH McKinley T34 guideline, checking expiry dates. **Check that the syringe driver is within its service date (via the equipment inventory and by switching the pump on to check "Calibration Due" warning does not display) BEFORE leaving base.**	→	To ensure all equipment is available before commencing the procedure.
4. Select and prepare medication to be administered according to prescription chart. • **Remember the 5 Rights** ➢ Right patient ➢ Right time ➢ Right dose ➢ Right route ➢ Right drug	→	To ensure that the patient receives medication as prescribed and in accordance with NMC guidance for the administration of medication.
5. Ensure that the area in which the medicine is to be prepared is as clean, uncluttered and free from interruption as possible.	→	To reduce risk of error
6. Wash hands following local Hand Hygiene Policy put on sterile gloves if using central line route. Gloves are not necessary for the subcutaneous route	→	To reduce risk of cross infection and adhere to Trust policy.
7. Select the most appropriate luer lock syringe size **(where possible use a minimum 20ml)** and infusion line and draw up each medication separately as per LTHT/ McKinley T34 guidelines (children's). **If using central line route prepare the drugs using non-touch/aseptic technique as appropriate**	→ →	To reduce risk of potential irritation caused by medications. To ensure correct dose of each medication is drawn up. To adhere to LCH T34 McKinley guidelines To reduce the risk of infection

Action	→	Rationale
8. Complete syringe driver label documenting patient name, **contents** of syringe (including **total volume**), **date, time** and **signature.** Apply the completed label to the syringe, **TAKING CARE NOT TO OBSCURE SYRINGE SCALE**	→	To identify contents of the syringe.
9. Attach the infusion line to the syringe and **PRIME** the line **before** loading onto the syringe driver.	→	To ensure the infusion does not finish early.
10. Switch the syringe driver on, ensuring the barrel clamp arm is down and allow pre-loading to complete. Check the battery life. Load the syringe and commence infusion set up according to manufacturer's instructions and LTHT/ McKinley T34 guidelines. Refer to steps 1-9 on the front of the driver if necessary.	→	To ensure safe operation of the driver.
11. **If using subcutaneous route**: select most appropriate site to insert the infusion line, ensuring the same site is not used consecutively.	→	To ensure optimum delivery of medication whilst facilitating patient comfort and compliance. Rotating the sites helps to prevent discomfort
12. Ensure infusion site is clean and dry and insert infusion needle (angle depends on line selected, Soft-set 90 degrees, Flo safer 45 degrees).	→	To prevent infection and allow safe delivery of the infusion.
13. **If using central line**: flush the line following appropriate procedure and connect to the syringe driver using non-touch technique.	→	To ensure line patent before commencing the infusion
14. Secure line using a transparent semi-occlusive dressing.	→	To allow observation of the site.
15. Start the infusion by pressing "YES" (step 10 on pump instructions). Check the infusion has commenced ("pump delivering" message displayed alternating with syringe size and brand and green LED light flashing every 32 secs) **Check battery life again after set up is complete**	→ →	To commence delivery of prescribed medication. To ensure battery will last for 24hrs following set up process.
16. Lock the keypad	→	To maintain safety of the infusion.

Action	→	Rationale
17. Ensure the child is comfortable, assisting to replace clothing as necessary.	→	To maintain dignity. To promote patient comfort whilst infusion in progress.
18. Complete syringe driver documentation and Medication Administration Record (MAR). Record any advice/instruction given to parent/carers well as any changes to medication as a result of symptom management.	→ →	To ensure accurate documentation of medication infusing. To ensure patients are aware of who to contact if there are any problems
19. Dispose of any remaining materials appropriately and according to local policies.	→	To ensure waste is disposed of safely.
20. Commence use of syringe driver monitoring chart.	→	To record observation of infusion whilst in progress.
21. At each **consecutive change of syringe or when the driver is no longer required**, switch driver off following the correct procedure, i.e. ➢ Unlock the keypad ➢ Press the RED stop button ➢ Turn off the pump by holding the ON/OFF button down until you hear a beep. ➢ Remove the syringe. ➢ Replace the barrel arm in the down position **N.B. Battery only needs removing if discontinuing use of the pump, NOT at each change of syringe.** Battery should only be changed at syringe change if less than 30 -35%.	→	To ensure the current programme is deleted prior to next programme being entered.

References

BNF (2009) for children

CME McKinley T34 Ambulatory Syringe Pump Operational Manual 2007

Dickman A, Schneider J, and Varga J (2002). The Syringe Driver- Continuous subcutaneous infusions in palliative care. Oxford University Press

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Nursing and Midwifery Council (2008) The Code - Standards of conduct , performance and ethics for nurses and midwives

Nursing and Midwifery Council (2008) Standards for Medicines Management

Nursing and Midwifery Council (2009) Record Keeping: Guidance for Nurses and Midwives (NMC 2009).

MDA Bulletin: Infusion Systems Medical Devices Agency March 2003 Report Number DB 2003 9020

The Children Act (1989)
Twycross et al (2002) Palliative care formulary. 2nd ed. Radcliffe Medical Press, Oxon.

Appendix 1

Equality Impact Assessment – Relevance Screening

1. Name of the policy/strategy/project or service	**Clinical Guideline for the Safe Use of the McKinley T34 Syringe Driver in Children's Services**			
2. What are the main aims and objectives of the policy/strategy/project or service?	The aim of this guideline is to support staff in the safe administration of medication via the McKinley T34 syringe driver and promote standardised practice across the LCH.			
3. Is this a key strategic document or a major project/programme	**Yes**		**No**	
			√	
4. What impact will this policy/strategy/project or service have on the public or staff?	**High**	**Medium**	**Low**	**Don't know**
			√	
Please explain: This is an adapted guideline for use with the McKinley T34 Syringe Driver. The McKinley T34 is a new infusion device in response to national recommendations. These recommendations are based on safety concerns about continued use of the current Graseby model (previously used). Staff will be better supported by the use of a newer, safer device to safely deliver medication subcutaneously to patients. Parents of children requiring medication to be administered by this device will be assured that LCH is using the safest device available.				
5. Is there any evidence, or other reason to believe, that different groups have different needs, experiences, issues and priorities in respect of this particular policy/strategy project or service etc?	**Yes**	**No**	**Don't Know**	
		√		
Please explain: Syringe drivers are only used with very small numbers of children who have palliative care needs. Care and sensitivity will be taken into consideration when dealing with the family to ensure where possible individual needs are met. However the needs and safety of the child would be paramount in line with The Children's Act (1989)				

If you have answered **Yes** to question 3, you should move straight on to a **Stage Two** Assessment.

If, for question 4 you have answered **Low**, there is no need to continue to an Equality Impact Assessment.

If for question 4 you have answered **Medium** and **No** for question 5, there is no need to continue to an Equality Impact Assessment.

If, for question 4 you have answered **Medium** or **Don't Know**, and have answered **Yes** or **Don't Know** for question 5 you should move on to a **Stage One** Equality Impact Assessment.

If, for question 4 you have answered **High**, you should consider whether you need to undertake a **Stage One** Impact Assessment or move straight to a **Stage Two** Impact Assessment.

	Stage One	**Stage Two**	**None**
6. Based this screening please indicate if this policy/strategy/project or service should proceed to a Stage One or Stage Two assessment?			√

Signed: (Adapted from EIA completed by Angela Gregson)
Karen Eaton, Professional Lead/Team Lead, Community Children's Nursing Service.

Appendix 2

WASP Competency Framework for the Initiation, Safe Operation and Monitoring of the McKinley T34 Syringe Driver

Aims and Objectives

This framework will allow the registered nurse to develop and demonstrate competence in the safe operation of the McKinley T34 syringe driver. **Staff must have attended training on the safe operation of the McKinley T34 syringe driver (see Training section in McKinley T34 guideline)**

Knowledge and Skill Requirements

Competency will be assessed through supervision in undertaking the procedure until proficient using the WASP framework. In addition the registered nurse will need to demonstrate that they know, understand and can apply in practice the following:

- an understanding of situations when it is appropriate to use a syringe driver to control clinical symptoms
- The importance of accurate record keeping.
- operation of the driver according to LCH McKinley T34 guidelines which govern safe practice.
- a good understanding of the problems which may arise whilst a syringe driver is in situ and the appropriate action to take.
- An understanding of personal responsibilities and accountability in this area of care including the importance of working within your own sphere of competence.
- An understanding of the medications that may be infused via the driver to control symptoms, including appropriate doses and calculations, their compatibility when mixed and resources to access further information as required.

W	WITNESSED	observe or witness the competency – it is considered good practice that the RN will have had the opportunity to observe the procedure prior to being supervised.
A	ASSIMILATED	understand the elements of the competency
S	SUPERVISED	practice under supervision to demonstrate understanding: score as follows: 1 = NEEDS FURTHER PRACTICE 2 = SHOWS APTITUDE 3 = PROFICIENT
P	PROFICIENT	Competent in both knowledge and skill elements of the competency.

	Action	Rationale	W	A and S			P
				Score	Score	Score	
1.	Explain the need for commencing /continuing the use of the syringe driver with the parent/carer and where appropriate with the child	Patient/parents/parent/carers consent is agreed following discussion and is documented in the patient care plan.					
2.	Assemble all materials and equipment as per LCH McKinley T34 guideline, checking expiry dates. **Check that the syringe driver is within its service date (via the equipment inventory and by switching the pump on to check "Calibration Due" warning does not display) BEFORE leaving base.**	To ensure all equipment is available before commencing the procedure.					

	Action	Rationale	W	A and S			P
				Score	Score	Score	
3.	Select and prepare medication to be administered according to prescription chart. • **Remember the 5 Rights** ➢ Right patient ➢ Right time ➢ Right dose ➢ Right route ➢ Right drug	To ensure that the patient receives medication as prescribed and in accordance with NMC guidance for the administration of medication.					
4.	Ensure that the area in which the medicine is to be prepared is as clean, uncluttered and free from interruption as possible.	To reduce risk of error					
5.	Wash hands following LCH Hand Hygiene Policy put on sterile gloves if using the central line route. Gloves are not necessary for the subcutaneous route.	To reduce risk of cross infection and adhere to Trust policy					
6.	Select the most appropriate luer lock syringe size **(where possible use a minimum 20ml)** and infusion line and draw up each medication separately as per LCH McKinley T34 guidelines. **If using central line route prepare the drugs using non-touch/aseptic technique as appropriate and wear sterile gloves.**	To reduce risk of potential irritation caused by medications. To ensure correct dose of each medication is drawn up. To adhere to LCH T34 McKinley guidelines To reduce the risk of infection					

	Action	Rationale	W	A and S			P
				Score	Score	Score	
8.	Attach the infusion line to the syringe and **PRIME** the line **before** loading onto the syringe driver.	To ensure the infusion does not finish early.					
9.	Switch the syringe driver on, ensuring the barrel clamp arm is down and allow pre-loading to complete. Check the battery life. Load the syringe and commence infusion set up according to manufacturer's instructions and LCH McKinley T34 guidelines. Refer to steps 1-9 on the front of the driver if necessary.	To ensure safe operation of the driver.					
10.	**If using subcutaneous rout:** select most appropriate site to insert the infusion line, ensuring the same site is not used consecutively.	To ensure optimum delivery of medication whilst facilitating patient comfort and compliance. Rotating the sites helps to prevent discomfort					
11.	Ensure infusion site is clean and dry and insert infusion needle (angle depends on line selected, Soft-set 90 degrees, Flo safer 45 degrees).	To prevent infection and allow safe delivery of the infusion.					
12.	**If using central line**: flush the line following appropriate procedure and connect to the syringe driver using non-touch/aseptic technique as appropriate and wearing sterile gloves	To ensure line patent before commencing the infusion					

	Action	Rationale	W	A and S			P
				Score	Score	Score	
13.	Secure line using a transparent semi-occlusive dressing.	To allow observation of the site.					
14.	Start the infusion by pressing "YES" (step 10 on pump instructions). Check the infusion has commenced ("pump delivering" message displayed alternating with syringe size and brand and green LED light flashing every 32 secs) **Check battery life again after set up is complete**	To commence delivery of prescribed medication. To ensure battery will last for 24hrs following set up process.					
15.	Lock the keypad	To maintain safety of the infusion.					
16.	Ensure the child is comfortable, and replace clothing as necessary.	To maintain dignity. To promote child's comfort whilst infusion in progress.					
17.	Complete syringe driver documentation and Medication Adminstration Record (MAR). Record any advice/instruction given to parent/carers well as any changes to medication as a result of symptom management	To ensure accurate documentation of medication infusing. To ensure parents are aware of who to contact if there are any problems					
18.	Dispose of any remaining materials appropriately and according to local policies.	To ensure waste is disposed of safely.					
19.	Commence use of syringe driver monitoring chart.	To record observation of infusion whilst in progress.					

	Action	Rationale	W	A and S			P
				Score	Score	Score	
20.	At each **consecutive change of syringe or when the driver is no longer required**, switch driver off following the correct procedure, i.e. ➢ Unlock the keypad ➢ Press the RED stop button ➢ Turn off the pump by holding the ON/OFF button down until you hear a beep. ➢ Remove the syringe. ➢ Replace the barrel arm in the down position **N.B. Battery only needs removing if discontinuing use of the pump, NOT at each change of syringe.** Battery should only be changed at syringe change if less than 30 -35%.	To ensure the current programme is deleted prior to next programme being entered					
DATE							
	SIGNATURE ASSESSOR						
	SIGNATURE RN						

Declaration

After being assessed I feel competent and confident to operate the McKinley T34 syringe driver safely and according to the LCH McKinley T34 Guidelines.

Name (Print) ..…….. Signature:……. Position:……..

Appendix 3
Procedure for drawing up medications/diluent separately for Syringe Drivers

1. Each drug ampoule, expiry and strength and volume drawn up is to be checked carefully.

2. Calculate the total volume of drug solution in the syringe.

3. Select a 20ml or 30 ml luer-lock syringe as appropriate.

4. Assemble the correct number of ampoules of medications required, including the diluent and a sharps bin.

5. Calculate the volume of each medication in the driver and select the appropriate size syringe – syringes can be reused if there is more than one drug requiring that size syringe

- Doses which measure 1ml or less require a 1ml syringe (Not an insulin
- syringe)
- Doses which measure >1ml and up to 2.5ml require a 2ml syringe (which
- measures 2.5mls)
- Doses which measure >2.5ml and <6mls require a 10 ml syringe
- Doses which measure >6mls can be drawn up directly into the final 20ml/30ml
- syringe that will be attached to the driver.

(The rationale for this is that there is a dead space of approximately 0.3mls at the end of a syringe. If you allow a 5% error margin in the preparation of the syringe this would mean that the minimum volume that you should draw up first into the final 20ml/30ml syringe is 6mls).

6. Select the number of needles required (number of syringes +1 for the diluent and attach a sheathed green needle to each syringe (leaving one needle remaining for use later. Where the drug is being drawn up from a glass ampoule a white filter needle must be used to prevent glass particles contaminating the infusion.

8. If using central line route prepare the drugs using non-touch

7. Check the drug concentration, expiry and the volume of each drug to be used. If the combination contains a medication of volume more than 6mls this should first be checked and drawn up into the 20/30 ml syringe. The ampoules should be placed to one side for the final check. The other drugs should be drawn up using the correct sized syringes. **Don't forget that ampoules containing liquid preparations nearly always contain an overage, so measure the exact amount of liquid drug required using an appropriately sized syringe.**
These may be added to the final 20/30ml syringe following a second check of the drug concentration, volume and expiry date. Again the ampoules should be retained for the final check.

8. When all of the required drugs have been drawn up, a final check is performed of the remaining empty ampoules against the prescription sheet to ensure all the required medications have been drawn up and added to the syringe.

9. A new needle is put onto the final 20ml/30ml syringe, the contents gently agitated and air expelled. The medications are made up to the final required volume using the diluent. The syringe contents can now be mixed gently and the air expelled.

Appendix 4 Trouble shooting/alarm guide

Fault	Possible Cause	Action
The pump will not start	There is no battery present The battery has been inserted incorrectly The battery depleted/very low The pump is faulty	Fit a battery Realign battery terminals Fit a new battery Service required
The infusion is going too quickly/ has ended early or too slowly/ volume remaining in syringe at end of infusion	Incorrect rate set Wrong syringe brand confirmed during set up Pump faulty or incorrectly calibrated	Check displayed rate against prescription, and change if necessary. Re-train user to prevent repeat of this event. Service/calibration required.

McKinley T34 pump alarm conditions

When the pump detects a problem 4 things occur:

- The infusion stops
- An audible alarm is activated
- A message appears on the display screen indicating the cause of the alarm
- The LED indicator turns red

The following table indicates the appropriate actions to be taken

Alarm	Possible Cause	Action
Occlusion or syringe empty	Pt access device blocked, kinked, clamped or occluded. Actuator has reached minimum travel position	Remove occlusion and restart or re-load syringe Flush or replace access device. Release clamp. End of program, turn pump OFF
Syringe displaced	Syringe has been removed or displaced	Check & confirm syringe seated correctly and resume
Pump paused too long	Pump left or no key presses detected for 2 minutes	Start infusion, continue programming or switch off
Near end	15 minutes from end of infusion	Prepare to change syringe or switch off
End program	Infusion Complete	Pump will either default to KVO (keep vein open) or it will alarm in which case switch pump off and await nurse to replenish/remove
Low battery	Battery is almost depleted (30 minutes left)	Prepare to change battery
End battery	Battery is depleted	Change battery

Further details can be found in the CME McKinley T34 operation manual, available from here

CME McKinley T34 user guidelines

Appendix 5

PM3

NHS Leeds

Syringe Driver

Patient name: ______ **DOB:** ______

NHS number: ______ **Allergies:** ______

Syringe driver reference number: ______

Driver in use: **Graseby MS26 / MS16A / other.** *(please state)* ______

Drug	Dose
Over .... hours via syringe driver	
Date	Authorised by:
Discontinued date	Transcribed by:

Date/time	Rate set	Signature

Drug	Dose
Over .... hours via syringe driver	
Date	Authorised by:
Discontinued date	Transcribed by:

Date/time	Rate set	Signature

Drug	Dose
Over .... hours via syringe driver	
Date	Authorised by:
Discontinued date	Transcribed by:

Date/time	Rate set	Signature

At each visit check: site, rate, operation, connection secure/ battery strap in correct postion

Infusion slow or stopped? Site inflamed? Cannula kinked? Start button not pressed? Battery failure? Needs cleaning/servicing?

Infusion too fast? Check rate setting. Check rate calculation. Faulty machine

PM3

Syringe Driver

Patient name: | **DOB:**

NHS number: | **Allergies:**

Drug	Dose	Date/time	Rate set	Signature
Over .... hours via syringe driver				
Date	Authorised by:			
Discontinued date	Transcribed by:			

Drug	Dose	Date/time	Rate set	Signature
Over .... hours via syringe driver				
Date	Authorised by:			
Discontinued date	Transcribed by:			

Drug	Dose	Date/time	Rate set	Signature
Over .... hours via syringe driver				
Date	Authorised by:			
Discontinued date	Transcribed by:			

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At each visit check: site, rate, operation, connection secure/ battery strap in correct postion

Infusion slow or stopped? Site inflamed? Cannula kinked? Start button not pressed? Battery failure? Needs cleaning/servicing?

Infusion too fast? Check rate setting. Check rate calculation. Faulty machine

Appendix 6

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PM4

NHS Leeds

Controlled Drug Stock Record

Patient name: **DOB:**

NHS number: **Allergies:**

Drug: **Unit size:**

Date	Time	Dose	Existing stock / new stock to be added	No of units used	No of units remaining	Signatures	Batch number & expiry date of drugs used	Other remarks, drugs wasted site, route

PM4

NHS Leeds

Controlled Drug Stock Record

Patient name: **DOB:**

NHS number: **Allergies:**

Date	Time	Dose	Existing stock / new stock to be added	No of units used	No of units remaining	Signatures	Batch number & expiry date of drugs used	Other remarks, drugs wasted, site, route

Design for Health • Ref: 1423/09

Appendix 7

PM5

NHS Leeds

Non-controlled Drug Stock Record

Patient name: **DOB:**

NHS number: **Allergies:**

Drug: **Unit size:**

Date	Time	Dose	Existing stock / new stock to be added	No of units used	No of units remaining	Signatures	Batch number & expiry date of drugs used	Other remarks, drugs wasted site, route

PM5

NHS Leeds

Non-controlled Drug Stock Record

Patient name: **DOB:**

NHS number: **Allergies:**

Date	Time	Dose	Existing stock / new stock to be added	No of units used	No of units remaining	Signatures	Batch number & expiry date of drugs used	Other remarks, drugs wasted, site, route

Design for Health • Ref: 1429/09

Policy Consultation Responses

Responder (including job titles and organisation)	Comment and Date	Response from Author
Sue Hogstson, Senior Lead, Governance and Professional Development	**29.03.2010 – Well done a comprehensive document one comment for your consideration given the complexities re prescribing in children whom you comprehensively describe in section 10.1 Prescribing- I think it would be beneficial to include a reference to documenting prescribing decisions as section 13: documentation is predominately about records of administration and stock control and what documentation should be used.**	**Responder thanked and two references included, NSF for children and BNF for children**
Trish Thompson, Children's Oncology McMillan Nurse Specialist	**The lockable box will not lock if a 50ml syringe is used.** **Spelling mistake** **Appendix 3 use of filter needles for drawing up from glass ampoules recommended.** **Also should we be re-shearing needles?** **The McMillan nurses would leave a key in the house if they were involved.** **They would like to adapt guideline for use with children in the Acute Trust.**	**Guideline amended – use of two drivers if volume greater than 30 malls** **Spelling mistake corrected** **Use of filter needles included – this was an oversight as standard in paediatrics** **No – document amended.** **Guideline not changed as not leaving key is standard for LCHC** **Happy for the Acute Trust to use if authors acknowledged.**
Mike Miller, Consultant in Paediatric Palliative Care	**31.03.10** **1. I note the comment on not using Graseby pumps, presumably we sill can it the McKinley's are not available.** **2. Glad that central line use is OK.**	**Thanked for quick response.** **1. LCHC are very clear that the Graseby from our perspective will be withdrawn from service and will not be used. I don not think there will be an issue with availability as there is a pool that we can also access.** **2. No response required**

	3. Client group inclusion/exclusion – I assume you mean a Consultant Paediatrician. Can't GP's suggest the use of a syringe driver. 4. On occasion it has been appropriate for parents to be able to vary the rate of the grapey syringe driver. I assume that this is no longer allowable practice 5. Is there any way of doing a quick guide for practitioners. 6. Very useful, can Martin House use these if they acknowledge the author? 7. Drug Incompatibilities – I would suggest you use the reference The Syringe Driver – Continuous subcutaneous infusions in palliative care (2002). Dickman A, Schneider J, and Varga J, in this section	3. Wording changed to Consultant Paediatrician. There is no reason why a GP can't suggest a syringe driver but from our experience they rarely do but happy to include so covered re- worded 4. From LCHC perspective parents would not be able to vary the dose and I would question the legalities of them doing so. 5. The idea for a quick guide for practitioners is a good one but may not be able to complete within the time scale, but it is something to look at developing 6. No problem with Martin House using/adapting as long as the authors are acknowledged. 7. Reference included
Angela Gregson, Practice and Professional Lead – Palliative and End of Life Care	E- mailed current final to go to QG&R on the 12th. You will not I have taken out the syringe driver monitoring form – following a few comments, we've decided to pilot with a few teams first. You will also need to take out CQC reference You'll notice the arrangements for return of the pumps for servicing via stores on the adult guideline – are Children's Services not going to adhere to the same process.	Monitoring form removed from children's guideline – cross referenced Children's guideline with adult CQC reference removed Process already in place in Children's Services for returning Syringe Drivers to the Acute Trust – no need to change system Angela thanked for her help and support with the guideline.

Gill Armstrong, Lead for Quality, Governance and Professional Development	**Can you cross reference with Angela's attached signed off document as there were a few changes made following C-Gap and after that too which may affect this document. Eg. Main body and appendices.**	**Document cross referenced and changed as appropriate.**
No other comments received.		

Clinical Policy Consultation Process

Title of Document	**Clinical Guideline for the Safe Use of the McKinley T34 Syringe Driver in Children's Services**
Author (s)	Karen Eaton, Professional Lead/Team Lead, Community Children's Nursing Service Adapted from Adult guidelines written by Angela Gregson, Governance and Professional Development Lead Palliative and End of Life Care
New/ Revised Document	Revised/Adapted
If the document is revised what revisions were required and for what reasons e.g. change in medical procedures or change in legislation	Change to new syringe driver for Leeds as a result of MHRA recommendation due to safety concerns re current Graseby model. Children's guideline adapted from adult for safety reasons
Lists of persons involved in developing the policy	Karen Eaton, Professional Lead/Team Lead, Community Children's Nurisng Service Angela Gregson, Governance and Professional Development, Lead Palliative and End of Life Care
List of persons involved in the consultation process	**Doreen Escolme, Head of Service – Community Children's Nursing Children and Family Services Susan Hogston, Senior Lead, Governance & Professional Development (on behalf of Medical Devices Group) Debbie Myers, Governance and Professional Development Lead for Education, Carolyn Nelson, Head of Medicines Management, GPD, Gill Armstrong; Lead for Quality, Governance & Professional Development, Paul Morrin, Director of Operations, Care Services North East South & East. Angie Clegg, Acting Director of Operations, Care Services. Leeds Children's Nursing Team: Community Children's Nurses: Jill Crampton, Karen Thirkell, Heather McMillan, Mary Silcox. Senior Staff Nurses: Jan O'Hara, Tracey Hamnett, Sarah Conroy. Staff Nurses: Heather Thomson, Laura Christmas. Jo Dixon, Team Leader, Leeds Children's Continuing Care Team. Jo Dodd, Home Manager, Hannah House. Richard Chillery, General Manager, CAMHS. Sue Wilkinson, General Manager Children's Complex Care. Pam Hill, Head of Service, School Health & Specialist Services. Christina Fairhead, Head of Service, Safeguarding Children. Susan Imrie, Head of Service, Community Paediatircs. Rob Kenyan, Acting Deputy Director, Children's Services. Trisha Thompson, Children's Oncology Nurse Specialist, LTHT. Dr Mike Miller, Regional Children's Palliative Care Consultant.**