Serious Incident Case Study: Infant Morphine Overdose Investigation Summary & Learning

July 2023

NHS England North East and Yorkshire

A 4 week-old baby from the North East and Yorkshire region was recently treated in the Accident & Emergency department following an overdose of **morphine sulphate oral solution,** administered at a dose **20 times higher** than the intended dose.

The parents of the baby were supplied with a bottle of **10mg/5ml oral solution** instead of the **100mcg/ml oral solution.** The **100mcg/ml oral solution** is a **'RED DRUG – HOSPITAL ONLY DRUG' AVAILABLE AS A 'SPECIALS' PRODUCT** on most regional formularies. **RED drugs** should be initiated by specialists only, and the prescribing and dispensing retained within secondary care.

The baby survived following treatment with naloxone. A review of national incident data indicates that this is now the fifth incident where this has occurred since 2018 and in one case it led to the death of a baby.

This special patient safety case study summarises the key findings of the Serious Incident Review to help all our providers and healthcare staff learn from this incident and review their own systems and processes to help prevent a further **morphine sulphate 100mcg/ml oral solution** incident.

Provider	What actually happened?	Actions taken to prevent the incident and or learning opportunities
	• Handwritten hospital discharge summary was sent to the baby's General Practice • The discharge summary requested the GP to prescribe: **Oramorph 50mcgs/kg/per dose = 190mcg every 4 hours** • Despite classification of this product being a 'RED' drug in this Trust and ICB, it did not prevent the error from occurring	* Issue electronic discharge summaries; the Trust are now introducing an electronic record system in maternity and neonates to allow modification of the contents of discharge summaries to support patient safety * Discharge summaries should contain the full drug name, formulation, strength, clear dose instructions with consideration of daily maximum doses for PRN (when required) medication. For liquids, ensure dose instructions are in both quantity and volume (e.g. **mg/mcg and ml)** * Opportunity for the hospital pharmacist reviewing the discharge summary to identify the 'RED' drug and to not request the GP to continue to supply * Review current process of discharging patients on a 'RED' drug and what actions should be taken to prevent potential harm from communication breakdown during transfer of care * For the management and use 'RED' drugs, Trusts should ensure they have the necessary governance and assurance systems in place * The Trust informatics Pharmacist is investigating whether 'RED' drugs can be flagged more clearly on the prescribing and electronic systems * The Trust has planned education sessions for the medical staff to raise awareness of this incident, the availability of the special product and general understanding of 'RED' drugs * Share this incident alert with all relevant staff across the organisation to help prevent a reoccurrence * This patient would have benefited from the community pharmacy Discharge Medicines Service (DMS) and Trusts should review current progress with implementation of the DMS across the Trust * Where appropriate, Trusts and ICB Area Prescribing Committees to review classification of morphine sulphate 100mcg/ml oral solution

Provider	What actually happened?	Actions taken to prevent the incident and or learning opportunities
	• The GP Practice received a request from the baby's family for a prescription for morphine sulphate a few days after discharge • The lead GP for the baby issued an EPS prescription as per the hospital neonatal discharge summary • GP reviewing the discharge letter was unaware that a **100mcg/ml** product was available • The brand name 'Oramorph' mentioned in the discharge letter, directed the GP to issue the **10mg/5ml** morphine oral solution • The GP calculated the dose needed would be 200mcg based on the baby's current weight, which was correct as per British National Formulary (BNF) and sent a prescription as follows: **Morphine Sulphate 10mg/5mls Oral Solution** **200mcg every 4 hours PRN** **Weight: 4050grams** • The GP when preparing the prescription followed the discharge summary and stated the dose in micrograms only and did not specify dose in volume of the 10mg/5ml oral solution • In essence the error followed through from the discharge summary • An initial enquiry was raised by the community pharmacist to the GP practice, this was relayed to the GP by an inhouse Pharmacy Technician and reception team	* Conduct a face to face medicines reconciliation and ask parents to bring in current medicines supplied by the hospital. This could have helped identify that the **100mcg/ml** preparation is not available to prescribe on the GP system * The dose should have been calculated into volume of the **10mg/5ml** preparation, this would have meant administering a dose of **0.1ml** * Communication between the surgery and pharmacy when dealing with very complex medication issues may require direct clinician to clinician conversations * Adding weight and date of weighing on paediatric prescriptions will help pharmacists complete their clinical assessment of the prescription and reduce the need to further contact the prescriber / parents * The practice has implemented a 'gold' register for babies and children with complex conditions who can have improved access to named GP and clear handover arrangements with others in the surgery in the absence of the named GP
	• The Community Pharmacy received the prescription via EPS and two pharmacists were involved with the dispensing and supply over two days (Friday and Saturday) • The initial pharmacist who received the prescription from the GP practice queried how the discharge summary was written. The pharmacist had highlighted that the prescription would translate to **0.1ml** needing to be given at each dose, which would be a difficult volume to administer • This discussion with the GP practice occurred through the Pharmacy Technician via the reception team and not direct communication with the prescriber • Pharmacist handover notes had limited information to give the context to why the prescription was being queried • Both pharmacists were unaware of the **100mcg/ml** strength being available as a **specials product** • Pharmacy support staff transcribed the dose from the prescription directly on to the dispensing label without any additional information describing the dose volume to be administered • The pharmacy dispensing label included the medical abbreviation from the prescriber 'PRN' and was not changed to as and when required • Pharmacist on duty was inappropriately reassured by the parents that they had previous experience of the dose and verbally mentioned that they would need to give a **0.1ml** dose • No syringe was provided to the parents to enable them to measure a **0.1ml** dose	* Check with the parents how they are measuring the current dose of **0.1ml**; this would have been difficult to measure using a 5ml oral syringe commonly supplied and could have helped identify the error earlier as the parents were giving a dose of **1.9ml of the 100mcg/ml specials product** * Pharmacists could have asked the parents to bring in their current bottle with the hospital pharmacy dispensing label on it to check against * Pharmacy team should have calculated and added the volume to be administered at each dose on the pharmacy dispensing label * Pharmacist at the point of supply, should have used this opportunity to counsel the parents, show them the medication bottle and clarify the dose and volume to be administered using a 1ml syringe * Speaking directly to the prescriber for medication queries with high risk drugs / or patients with complex conditions * Ensure you leave clear and thorough handover notes for prescriptions with queries * Ensure you are keeping paper / electronic records of any significant intervention you make * Document any key counselling points on the patients medication record * Ensure you have in stock 1ml oral medicine syringes to support patients with small volumes and during counselling demonstrate the markings on the syringe
Parents 	• Parents were unaware of the difference in strength and in the absence of any clear instructions, continued to give the same volume of **1.9ml** every four hours when required • The infant was getting **3.8mg** instead of **190mcg** and a single dose was administered before requiring emergency treatment	* When counselling, ask patients to summarise and recall main points back to you to check their understanding * Patient counselling across all settings on the dose to be taken / given and the importance of checking the medicine supplied; if ever in doubt to contact the dispensing pharmacy for confirmation

7 Actions

to help prevent another Morphine 100mcg/ml oral solution incident

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1. Share this alert with all relevant staff, including locum / agency workers within your organisation so they all know that Morphine sulphate oral solution **100mcg/ml** is available as a '**SPECIALS**' product for use in / supply from Secondary Care only. It is classed as a **'RED'** drug on many regional formularies, so should **NOT** be prescribed in Primary Care settings. Chief Pharmacists to cascade to all relevant specialities across the trust, including junior doctors.

2. Review / audit current process of discharging patients prescribed this preparation and whether any improvements are needed to help prevent a similar incident.

3. Brand names (e.g., 'Oramorph') should **NOT** be used in communications either written or verbal, unless it is prescribed as a branded product with the strength of the preparation clearly stated on any communication.

4. Ensure **ALL** communications (**discharge summaries** / **prescriptions** / **dispensing labels**) specify the strength of the product intended, as well as the dose expressed in **both volume** (e.g., ml) and **quantity** (e.g., mg/mcg) e.g., 'Morphine Sulphate **100mcg/ml** oral solution — **'Take 2ml (200mcg) every four hours when required'**.

5. Do **NOT** assume that other clinicians or carers (including parents) involved, have got it right and always clarify any concerns you may have before making any supplies. Communication between the GP practice and pharmacy when dealing with very complex and high risk medication queries may require direct clinician to clinician conversations.

6. If a new high risk product is issued for the first time in a community pharmacy, take the time to ask the patient / parents / carer what dose they were giving before or are expecting to administer, then compare this to the prescription issued and query if necessary. Where appropriate ask the patient / parents / carer to bring any current supplies to the pharmacy to help you review the current prescription before dispensing.

7. The dispensing pharmacist **MUST** counsel and demonstrate the dose volume to the parent / carer, even if it is believed that they already know. Ensure you have in stock 1ml oral medicine syringes.

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