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SP8

CREATING ACCEPTABLE TABLETS 3D (CAT 3D): A FEASIBILITY STUDY TO EVALUATE THE MOUTHFEEL OF 3D PRINTED TABLETS IN CHILDREN AND YOUNG PEOPLE

¹Louise Bracken*, ¹Emma McDonough, ¹Joanne Shakeshaft, ²Fiona Wilson, ²Udeme Ohia, ³Mohamed A Alhnan, ⁴Rober Habashy, ⁴Robert Forbes, ¹Matthew Peak. ¹Paediatric Medicines Research Unit, Alder Hey Children's NHS Foundation Trust; ²NIHR Alder Hey Clinical Research Facility, Alder Hey Children's NHS Foundation Trust; ³School of Cancer and Pharmaceutical Sciences, Kings College; ⁴School of Pharmacy and Biomedical Science, University of Central Lancashire

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Aim To evaluate the feasibility of a study investigating the mouthfeel of different sized 3D printed placebo solid dosage forms (SDFs) in children and young people (CYP) aged 4–12 years.

Method All participants in the CAT 3D Study had previously participated in the Creating Acceptable Tablets (CAT) Study, a feasibility study which assessed the swallowability and acceptability of different sized placebo tablets, and therefore only attempted to swallow one 3D printed tablet. If the participant had successfully swallowed all three tablet sizes in the CAT Study (6 mm, 8 mm, 10 mm) they were then randomised to receive any of the 3D printed tablets – 6 mm, 8 mm or 10 mm diameter. If a participant had not successfully swallowed all tablet sizes, they were allocated a 3D printed tablet of equal size to the largest tablet they had successfully swallowed in the CAT Study. Following informed consent, participants were shown a short video demonstrating how to swallow a tablet. Participants were then provided with the sample 3D tablet and 150 mL of still water in a cup. The volume of water required to swallow the tablet was measured, and further water was provided, where requested. The researcher observed and recorded the child's facial expressions as they swallowed the tablet¹, and an internal inspection of the mouth was conducted by the researcher to identify any residue or non-swallowed tablet.² The participants assessed the swallowability, acceptability, mouthfeel and taste of the sample using a 5-point hedonic facial scale on a participant questionnaire. Faces 1–3 on the hedonic scale were deemed acceptable to the participant. The participants were also asked if the 3D printed tablet was a medicine, would they be willing to take it every day. In addition, they were asked which tablet felt better in the mouth as a comparison of mouthfeel between the GMP manufactured coated tablets (CAT study tablets) and the 3D printed tablets.

Results A total of 30 participants were recruited to the CAT 3D Study, 87% of whom successfully swallowed the 3D printed tablet that they attempted to take. Attributes of the 3D printed tablets were scored as acceptable by the following percentage of participants – swallowability (80%), mouthfeel/texture (87%), volume (80%), acceptability (83%) and taste (93%). 77% of children advised they would be happy to take

the tablet every day if it were a medicine. Participants were also asked which tablets felt better in the mouth – the CAT tablets or the 3D printed CAT 3D tablets, and the most popular response was that both felt ok (43%).

Conclusions The data from this study shows that 3D printed SDFs may be a suitable dosage form for children aged 4–12 years. The results from this feasibility study will be used to inform a larger, definitive study looking at the mouthfeel of 3D printed tablets in children.

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SP9

THE KIDZMED PROJECT PART 1: PILL POPPING HEROES

Nicola Vasey*, Vincent Tse, Ailsa Pickering, Emma Lim. Great North Children's Hospital, Newcastle Upon Tyne

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Background There are large groups of children where families have problems obtaining ongoing supplies of their children's medicines in primary care due to them being high risk and complex, unlicensed, off label or expensive. The KidzMeds project was established 'For all children to get the right medicine at the right dose at the right time with the right monitoring with minimum fuss wherever they live.'

Tablets are safer, more convenient and cheaper than liquid medications. Children often remain on liquid due to habit, reluctance and parental and staff not knowing how to convert. The idea of converting came from initial HIV medications which were only available in tablets¹; children as young as 3 years could be taught.^{2 3}

Aim Quality improvement project to teach children and young people (CYP) on long term medication how to take tablet medication in an out-patient setting.

Method Working with families and our teams we created an interactive training package with video (<http://northernpaediatrics.com/kidzmed/>) and comic poster. We ran interactive hour-long training sessions for staff. Using positive reinforcement and play, the trainer sat facing the learner with sweets or dummy filled capsules of increasing sizes, from size 3 (15 mm) to size 00 (23 mm).

Over the next 12 weeks in one team we embedded a process for children ≥5 years attending complex renal clinics to be converted from liquid to tablet medication unless contraindicated (e.g. swallowing or cognitive impairment).

Outcome measures included successful conversion rate, patient and staff feedback and cost savings.

We overcame practical barriers by placing easily accessible 'switching kits' in clinic filled with the necessary dummy pills, awards and certificates. To increase confidence, we created a sealed dosette box with common medications so children could see the size of tablets they needed to swallow. Working with the clinical team we standardised processes (e.g. how to round doses, pre-screening clinic lists and creating prompts).

Results Over three months, 90 CYP were seen in 13 multi-disciplinary renal clinics, 25 were suitable for conversion to tablet medication. 21 CYP (median age 8.4 years range 5.1 to 15.5) were successfully converted (only one patient required

two sessions). 36 medicines were switched, generating £46,500 per year recurrent savings.

Feedback was good. Staff liked the opportunity for positive interaction with children and families appreciated the ease of obtaining tablet medications versus liquids. We subsequently trained other teams, including our research team who were recruiting for a study in which swallowing tablets is an inclusion criteria.

Conclusions In a short timeframe it is possible to embed a system to convert children to tablet medication, improving patient experience and realising considerable cost savings. It requires staff training and cultural change. Pill swallowing is an easy skill to teach and learn and children as young as five can successfully swallow pills. We automatically teach inhaler technique so equally we should teach CYP how to swallow tablets as a skill for life. We would encourage all units to set up pill swallowing training.

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P01

AN EVALUATION OF VANCOMYCIN THERAPY IN PAEDIATRIC PATIENTS POST GUIDELINE CHANGE

Adedoyin Agbonin, Joanne Crook*. *Chelsea and Westminster Hospital*

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Aim To evaluate the prescribed dose of vancomycin as per local guideline and review the achieved therapeutic drug levels. **Method** Retrospective data was collected from paediatric inpatients that were prescribed vancomycin for more than 24 hours during the audit period. Data was obtained from the Trust's electronic prescribing system, LastWord. Measured standards included initial vancomycin dose, dose prescribed for renal impairment, time to first trough level and any required dose adjustments as per local guidance. The dose bands for each age group were¹; birth - 6 months 15 mg/kg 8 hourly; >6 months -12 months 20 mg/kg 8 hourly; >12 months - 12 years 25 mg/kg 8 hourly; >12 years 20 mg/kg 8 hourly. The number of patients achieving therapeutic vancomycin trough levels was recorded. Safety data was collected, including reported adverse effects, infusion related reactions and renal impairment. Renal impairment was defined as an increase in creatinine by 50%. Data was collected from April 2018 for 6 months. Relevant data with regards to patient demographics, dosing and drug levels were collected and analysed using Microsoft Excel.

Results 12 patients received 15 doses of vancomycin over 6 months. 67% of initial vancomycin doses were prescribed as per local guideline, 60% of therapeutic trough levels were taken at the right time and 71% of patients that were prescribed the correct dose and had levels taken at the right time achieved therapeutic trough levels. 12 patients required dose adjustments. One patient with renal impairment was not prescribed the recommended dose as per local guidance. One patient reported an infusion related reaction, which was overcome by increasing the infusion time. Two patients who received therapy for >7 days accumulated vancomycin and

recorded high trough levels, with no adverse events. One patient reported an increase in creatinine by 50% over the treatment period.

Conclusions Vancomycin has the potential to induce nephrotoxicity and ototoxicity when consistently at high serum drug levels. Due to its narrow therapeutic index, drug levels should be monitored to ensure the drug does not accumulate. The licensed dose and dose listed in the BNF for Children^{2,3} has historically under dosed patients at our trust, leading to the risk of ineffective therapy and bacterial resistance. It is unclear from research what the optimal dose is for paediatric patients.

More research is needed to determine the correct paediatric dose of vancomycin. Higher doses than currently recommended as per licence resulted in three quarters of patients achieving therapeutic levels, however 12 patients still required dose adjustment. No patients suffered irreversible adverse effects or toxicity, suggesting that higher doses are safe to use in the paediatric population. Further education is required for those involved in the prescribing, administering and monitoring of Vancomycin in paediatric patients to ensure its safe use. Additional monitoring is required for those receiving higher doses >7 days to prevent drug accumulation, alternatively a loading dose followed by lower maintenance dose may be a more suitable dosing regimen.

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P02

METHODS USED WHEN PREPARING NON-STANDARD GLUCOSE CONCENTRATIONS: A SURVEY OF UK NEONATAL UNITS

¹Robyn Hart, ²Adriece Al Rifai*, ²Andrew Wignell. ¹School of Pharmacy, University of Nottingham; ²Nottingham University Hospitals NHS Trust

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Aims Administering intravenous (IV) glucose is common practice on the Neonatal Intensive Care Unit (NICU). The varying metabolic demands of patients in this environment coupled with the need for fluid restriction means the limited range of pre-made commercial products is not appropriate in every case. This can necessitate bedside preparation of glucose solutions, usually through addition of concentrated 50% glucose solution to a commercially available bag. Most IV glucose bags available contain an overage, i.e. they are filled to a greater volume than stated on the bag. Overages are quoted as ranges rather than absolute values, and vary according to manufacturer. This may lead to uncertainty as to the exact amount of 50% glucose to add in order to create the intended final concentration.

We aimed to determine the availability of guidelines to facilitate the safe, accurate preparation of non-standard glucose concentrations in NICUs across the UK, and to ascertain the range of methodologies in use.

Methods NICUs throughout the UK were identified and contacted via telephone. The following questions were asked:

1. Do you ever prepare non-standard glucose concentrations, for example 12.5%, 15% or 25%?