Oxford Academic Health Science Network
Children

Milton Keynes University Hospital NHS
NHS Foundation Trust

Delivering the influenza vaccine in Paediatric Outpatients: a new model of immunising children

Until now, hospital doctors have had to advise children and parents to obtain the influenza vaccine from their GP. Understandably, some busy parents don't always follow up on this advice. We wanted to make it much easier to get the vaccine while in hospital and I'm pleased we have seen an improvement in uptake rates, particularly amongst those children who are at risk of developing serious symptoms if they contracted influenza. This will help to prevent the spread of influenza in children, their families and the wider community. This initiative has been made possible by our work with the Oxford AHSN Children's Network."

Joe Harrison, Chief Executive,
Milton Keynes University Hospital

Milton Keynes children's influenza vaccine team: Alison Turner, Catherine Swailes, Malene Kofoed

1 Introduction

This report describes an innovative approach to delivering the influenza vaccine to children in paediatric outpatient clinics at Milton Keynes University Hospital during the 2016/7 influenza immunisation programme. It describes how the initiative started and the preparatory work undertaken to launch the service. It describes the rate of uptake and highlights that, of those vaccinated, nearly all were in clinical risk groups and thus more likely to become seriously ill if they contracted influenza. It explores the extent to which the three aims of the project were met and discusses the feasibility of commissioning a children's influenza vaccination programme in the acute sector.

2 Background

The live attenuated influenza vaccine (LAIV)[1] (hereafter referred to as the nasal influenza vaccine) for children was introduced in the UK in 2013, following a recommendation from the JCVI that all children aged up to, and including, 16 should be immunised against this disease annually. The programme is part way through its phased implementation: in 2013/14, 2-3 year olds were included, in 2014/15, 2-4 year olds, in 2015/16, school years 1 &2 were added and in 2016/17, school year 3 was added. Throughout, children aged 6 months – 18 years in defined clinical risk groups have been included in the national influenza programme as they were prior to 2013.

The principle model of delivery to date has been for GPs to offer the vaccine to children aged 2-4 and those in clinical risk groups and for older children to be offered the vaccine in their schools, delivered either by school nurses or, in some cases, a private provider. In some regions school-aged children have also been vaccinated within GP practices rather than a school setting.

3 Uptake

Uptake of the children's vaccine has varied across, and within, Clinical Commissioning Group (CCG) populations as well as for different cohorts of children. The highest rate of uptake is in the school-based population where this part of the programme has been delivered within the school setting. In Milton Keynes in 2016/17, 53.4% of children in school years 1-3 received the vaccine via the school-based provider, compared with 40% of 2-4 year olds by their GP.

In November 2016, during a review of Children's Network by the AHSN's Oversight Group, the Chief Executive of Milton Keynes University Hospital (MKUH) and member of the Oversight Group, noted the low uptake of the children's influenza vaccine in Milton Keynes in the Children's Network report on the 2015/16 influenza immunisation programme. He suggested the current model of delivery could be augmented by offering the vaccine in the Paediatric Out Patient(OP) Department of MKUH.

The Children's Network agreed to support this initiative as a means of testing the feasibility of such a model of delivery. Negotiations with stakeholders began immediately and the service was launched at the beginning of January 2017.

The remainder of this report describes the steps taken to establish the service as well as an evaluation of the model and suggestions for future work.

[1] A four-valent vaccine that contains live influenza viruses that have been attenuated (weakened) and adapted to cold so that they cannot replicate efficiently at body temperature.

4 Aims

The aims of this pilot were:

1 To improve uptake of the children's influenza vaccine overall and, in particular, uptake in children in clinical risk groups who are potentially likely to become more severely ill should they contract influenza.

2 To assess whether delivering the children's influenza vaccine in an outpatients' setting is *possible*.

3 To assess whether delivering the children's influenza vaccine in an outpatients' setting is *feasible*.

5 How the Service was established

5.1 Initial steps

Initial steps to establish the service involved a series of telephone conferences with stakeholders including the MKUH's deputy chief nurse, paediatric matron, children's service manager, the local Screening & Immunisation team, a paediatric pharmacist and a representative from PharmOutcomes (the company which records the details of children who have been immunised and informs their GPs).

Three teleconferences were used to clarify the following points:

- Public Health England (PHE) vaccine supplies' agreement to supply the nasal vaccine for the remainder of the current influenza season only, on the basis that the number of vaccines ordered will be small and will be closely monitored. This is an exception and out of the national model but would support the pilot.
- The cohort of children to be offered the vaccine: 2-4 year olds, and all children in clinical risk groups attending children's outpatient appointments.
- That the vaccine would not be offered to immuno-compromised children (as a live vaccine) or in the Emergency Department[2] .
- The intra-muscular vaccine would not be offered for those children for who the LAIV was contraindicated. Children requiring this would be referred to their GPs to be vaccinated.
- The need to liaise with local GPs who are commissioned to deliver the vaccine to these cohorts of children.
- Informing other stakeholders such as the local Clinical Commissioning Group.
- The standard PHE produced consent form from which a local version would subsequently be adapted.
- The recognition that a Patient Group Direction (PGD) would be required for nurses to administer the vaccine within the service.
- Agreement of the need to publicise the service with a poster.
- The need for training for staff delivering the vaccine

[2]It was noted that one other Hospital Trust was offering the children's influenza vaccine in their Emergency Department.

5.2 Planning the service

While the three teleconferences defined the boundaries of the proposed pilot and brought the stakeholders together, it also identified areas that needed further work before the service could launch. As this was the first time that the influenza vaccine has been planned to be delivered in a paediatric outpatient setting, there was no template or Standard Operation Procedure (SOP) that could be utilised.

Resolution of these areas resulted in the proposed launch date being put back from mid-December to January 5th 2017. One of the key factors that made the launch of the pilot possible was the drive and enthusiasm of lead nursing staff as well as other stakeholders such as the hospital pharmacist and colleagues in PharmOutcomes. Below is a summary of the main areas that were addressed.

5.2.1 Patient Group Direction (PGD)

A draft PGD was provided by the Screening and Immunisation Team and required adapting for the hospital based service. In recognition of the tight deadline for launching the pilot, approval of the PGD for use in MKUH was fast-tracked within 3 weeks, a process that would normally require 3-4 months. For advice on modifying the national PGD template, contact the Children's Matron at Milton Keynes University Hospital.

5.2.2 Procuring the vaccine

Following a request by the Screening and Immunisation manager, PHE vaccine supplies agreed to deliver the nasal vaccine for the remainder of the current influenza season. There was an expectation that the number of vaccines ordered would be small and that their use would be closely monitored to minimise vaccine wastage.

Subsequently, the nasal influenza vaccine was ordered by our paediatric pharmacist and stored in the pharmacy department until required. When a clinic was to be run with children likely to be eligible for immunisation, the nurse would obtain a box of vaccines which would be stored in the refrigerator in the OP department. The 'fridge's temperature was checked daily and prior to use by the nursing staff ensuring that the cold chain was maintained. Unused vaccines were returned to Pharmacy. Further supplies of the vaccine were ordered when required by the nurse running the programme through the paediatric pharmacist.

5.2.3 Staffing

Although 6 nurses attended the initial training, the Matron leading the pilot opted for a staffing model consisting of one dedicated influenza nurse "lent" from ward duties with support from the Paediatric Practice Facilitator. The benefit of this model is that the nurse quickly developed a degree of experience and expertise. The dedicated influenza nurse was backfilled through agency staff. This influenza nurse also had experience this year of delivering the adult influenza vaccine to hospital staff vaccine.

The dedicated influenza nurse was available for four days per week to cover the clinics meaning that not all OP clinics could be covered.

5.2.4 Training

There was initial lack of clarity as to the extent and nature of the training that was required to prepare the nurses for delivering the vaccine in an outpatient setting.

Initial training of a 90 minute session was provided to six paediatric nurses on December 7th by the Children's Network Nurse who is experienced in vaccination theory and practice.

This session included:

- an overview of influenza
- the 2016/17 programme and the Milton Keynes Outpatients role,
- the live attenuated influenza vaccine and its contraindications,
- Patient Group Directions (PGD),
- recording administration and informing relevant parties.

The small group allowed opportunity for questions and voicing of anxieties. The training also identified additional training elements that needed to be delivered to staff. These included:

- who would assess clinical competence to give the vaccine,
- the process of working under PGDs,
- practical use of the nasal vaccine.

Though evaluated positively, a longer training session would have been ideal, potentially 3 hours in length delivered at a time when logistics to all components of the project were available. In addition, delays over the Christmas period in receiving the demonstration applicators meant that these could not be included in the training programme.

Subsequently, the matron identified further sources of training to supplement this session. This comprised an eLearning session on components of the children's influenza programme written by PHE, and produced by Health Education England's eLearning for Healthcare and further training on the use of the PGD delivered by the paediatric pharmacist.

The nurses also completed an assessment to confirm their competency; the **Royal College of Nursing Immunisation knowledge and skills competence assessment tool**

5.2.5 Consent Form

The PHE standard consent form was adapted to make it appropriate to the pilot service (see Appendix 4) Please note that this consent form was relevant to the 2016/17 influenza programme only.

5.2.6 Informing GPs

In advance of the launch, the project leads liaised with PharmOutcomes, a web-based system which records influenza immunisations undertaken by community pharmacies. A letter to the patient's GP was drafted which could also be printed out and given to parents with the details of their child's vaccination. A PHE produced leaflet – **"Protecting your Child against Flu, Information for Parents"** – was also provided.

PharmOutcomes did not inform the Child Health Information Service (CHIS) (A surveillance system which is used to capture and record all childhood vaccines administered). PharmOutcomes has subsequently advised that a process can be established to perform this function, though at a cost.

5.2.7 Identifying eligible children

Children eligible for immunisation were identified by the dedicated influenza nurse. At the start of the clinic, she liaised with the consultant or registrar running the clinic and/or the specialist nurse to highlight children on their lists who fell within the age cohort or were within a clinical risk group. Identifying children in this latter category was easier in some clinics than others. For example, all diabetic patients count as high risk whereas for those attending the cardiac clinic, more details of the child's medical condition were required to determine eligibility.

5.2.8 Advance information to parents

Early in the project, it was identified that contacting parents in advance of the OP appointment would be beneficial to allow time to establish whether their child had already been vaccinated and for the patient information to be considered. This would help speed up the process of taking consent on the day. As a side benefit, it also acts as a reminder of the OP appointment and potentially reduces non-attendances. In practice, due to the project being introduced very quickly, this was done in an ad hoc fashion, time permitting. In addition, without undertaking further investigations, the nurse could only contact families of children who fell within the age criteria or were clearly within a clinical risk group, for example, the diabetes clinic patients.

5.2.9 Staffing

Some clinics are in main Outpatient department, located 10 minutes' walk away from the children's OP and, with the staffing levels dedicated to the pilot, it was not feasible to cover these.

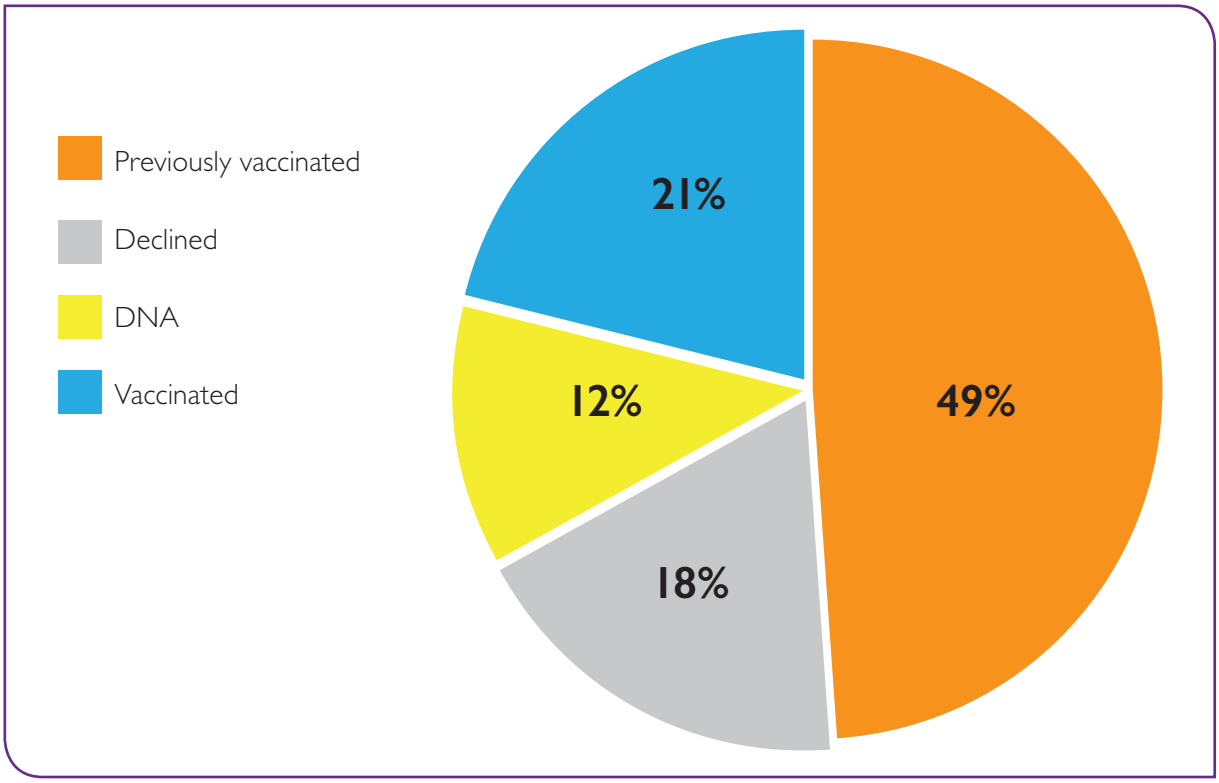
5.2.10 Safety

The project leads decided that they should establish a process to mitigate the risk of anaphylactic shock in children receiving the nasal vaccine. This took the form of a section in the influenza trolley which included a yellow tray with anaphylactic drug syringes and needles and an algorithm from the Resus Council with information on the appropriate dose of drugs.

6 Data analysis

The pilot ran from January 5th – February 22nd 2017. During this period, 69 clinics were covered, comprising a total of 668 children (see Appendix 1). Of these, 290 (43.5%) were eligible to be offered the influenza vaccine. 135 (49%) had already been immunised this season, leaving 155 who were offered the vaccine. Of these, 32 did not attend the outpatient appointment and 49 declined. The reasons for declining the vaccine in Outpatients are listed in Appendix 1. Three parents were unclear as to whether the child had already been immunised. In total, 58 children were immunised during the pilot.

Figure 1. Summary of vaccinations delivered. Total eligible children = 290



7 Discussion

The aims of running this pilot were threefold:

1 To improve uptake of the children's influenza vaccine overall and, in particular, uptake in children in clinical risk groups who are potentially likely to become more severely ill should they contract influenza.

2 To assess whether delivering the children's influenza vaccine in an outpatients' setting is possible.

3 To assess whether delivering the children's influenza vaccine in an outpatients' setting is feasible

7.1 Improving uptake

58 children were vaccinated during the period that the influenza vaccine was offered in outpatient clinics. This accounted for 21% of all the eligible children attending clinics, or 37% of those who had not already been vaccinated. Given that the influenza service only started in January, towards the end of the influenza programme, nearly half of the eligible children had already been vaccinated either at school or by their GP. If the programme is repeated in future, it will begin offering the vaccine from the start of the influenza programme (Sep-Oct), in all likelihood resulting in far more children being immunised.

It is also significant to note that the vast majority of those vaccinated fell within clinical risk groups and would have been more susceptible to becoming severely ill, were they to contract influenza. Offering the children's influenza vaccine at the point at which children are attending an outpatient clinic (often for the condition that places them in one of the clinical risk groups) is an efficient and timely method of ensuring vaccination and fits with the methodology of **"Making Every Contact Count"**[3].

[3]Making every contact count (MECC) is an approach to behaviour change that utilises the millions of day to day interactions that organisations and people have with other people to encourage changes in behaviour that have a positive effect on the health and wellbeing of individuals, communities and populations.

7.2 Is delivering the children's influenza vaccine in an OP setting possible?

In large part due to the dedication and enthusiasm of the MKUH paediatric nursing team, as well as other stakeholders, the pilot proved that it is possible to set up a service, offering the nasal influenza vaccine to children when they attend outpatient appointments. From the point of request to establish the service in mid-November 2016 to its launch at the beginning of January 2017, staff worked to overcome the various challenges of delivering the children's influenza vaccine in the acute setting, described in paragraph 5 above.

The future benefit of this preparatory work is clear: it has created a "How to" guide for the delivery of this service in an outpatient setting. Were MKUH to repeat this service in future years, the staff would be ready to set up from the start of the season with minimal additional preparatory work. They anticipate a one month run-in period to allow for informing other clinicians, the distribution of publicity and to retrain existing, and train new, staff.

7.3 Is delivering the children's influenza vaccine in an OP setting feasible?

The pilot has demonstrated that setting up a service to offer the children's influenza vaccine requires additional funding. The pilot utilised an existing Band 5 paediatric nurse, 0.8 working time equivalent to deliver the service, backfilled by agency staff and supported by the Paediatric Practice Facilitator. Depending on experience, a Band 5 nurse receives £11.20 - £14.36 per hour, equating to approximately £3k over the seven-week period when the vaccine was offered and a further £1.5k for the preceding setting up and training period.

This has not taken account of the time committed to the project by of other staff and influenza stakeholders: the Paediatric Practice Facilitator, the Children's Matron and other nurses.

The possibility of the existing OP clinic nurses administering the vaccine was considered but rejected. The process of explaining about, taking consent for, and delivering, the vaccine takes approximately 15 minutes and would add additional time to the clinic, thus reducing the throughput of patients. It is possible that other models of delivery could be considered, utilising a health care assistant, supervised by a Band 5 nurse but this is unlikely to result in significant savings.

During the pilot, the Trust did not request, and was not paid, the commissioning rate for each vaccine (£9.80). The income generated would have been disproportionate to the cost of setting up the system required to process this payment and, for a short-term project, was not deemed appropriate.

Cost savings from avoiding admissions of children in clinical risk groups who would otherwise have contracted influenza are potentially significant: the tariff for an overnight stay for paediatric respiratory conditions such as asthma, viral wheeze or bronchiolitis is ~£400. Children with influenza-like symptoms may be admitted for an extended length of stay, and for a small proportion, this will include admission to High Dependency Unit or Intensive Care Unit facilities.

8 Conclusion

This pilot project has proved that, with the commitment of dedicated staff, it is possible to establish a influenza vaccine service in Children's Outpatients. The offer of the vaccine in this setting is appreciated by parents and children who would otherwise be required to make a separate appointment with their GP if not provided within a school setting. Although not tested or proven during this pilot, given that the service started relatively late in the season (January), it is suggested that, had the vaccine not been offered at the OP clinic, some children would have remained unvaccinated and thus at risk of contracting influenza.

Though not measured, the importance of the pilot programme as advocacy for vaccination of vulnerable children will have had positive consequences beyond those vaccinated. It has served as a method to communicate that the doctors and nurses at MKUH were concerned enough about influenza to offer doses in children's OP clinics. This will have changed perception of the need for the influenza vaccine to protect the vulnerable and the community's responsibility to ensure they are protected.

The decision to continue with a model that offers the children's influenza vaccine in outpatient clinics should be based on weighing the benefits of reaching more children, particularly those in clinical risk groups, and thus reducing the prevalence and spread of influenza in the wider community against the cost of delivering this service.

NHS England Area Teams may wish to consider extending this pilot to other Hospital Trusts either within the AHSN region or more widely, utilising the preparatory work undertaken by MKUH. Further pilot studies would show the actual uptake of vaccine, especially amongst children in clinical risk groups, with the service running from the start of the influenza vaccination programme.

Appendix 1 Summary of vaccinations delivered[4]

Date	Clinic	No of Pts	Eligible	Already Vaccinated	N/K	Declined	DNA	Vaccinated
January 2017								
5th	General	8	2	-	-	-	-	2
	General	17	7	4	1		1	1
	Endocrine	9	2	-	1	-	-	1
6th	General	17	4	2	-	-	-	2
	General	10	1	-	-	-	-	1
9th	Respiratory	6	5	3	-	1	-	1
	General	11	4	2	-	-	-	1
	General	11	4	3	-	-	1	-
10th	Cardiac	23	13	3	-	3	3	4
	Respiratory	1	1	-	-	-	-	1
	Neonatal	11	1	-	-	1	-	-

[4]There are incomplete data in this table, so the rows do not always tally with the total number of children attending the clinic.

Appendix 1 Summary of vaccinations delivered[3]

Date	Clinic	No of Pts	Eligible	Already Vaccinated	N/K	Declined	DNA	Vaccinated
January 2017								
11th	Diabetic	8	8	2	-	2	1	3
	Diabetic	4	4	2		1		1
	Diabetic	2	2	2	-	-	-	-
12th	General	19	6	1	-	3	1	1
	General/endocrine	9	1	-	-	-	1	-
	Surgical	11	3	1	-	-	-	2
	Neurology	9	6	-	3	-	-	2
16th	Sickle Cell	4	4	4	-	-	-	-
	Respiratory	7	7	1	1	-	-	1
16th	General	9	3	3	-	-	1	-
	Dietetics	6	3	-	-	1	1	1
17th	IBD	8	2	2	-	-	-	-
	General	12	6	2	-	-	-	1
18th	Diabetic	7	7	5	-	-	-	2
	Diabetic	6	6	4	-	1	1	-
	General	21	5	2	-	2	-	1
	General	20	4	1	-		3	-
	Cardiac	26	12	4	-	3	2	3
19th	Endocrine	9	1	-	-	1	-	-
	Ultrasonography	8	1	1	-	-	-	-
23rd	General	11	0	-	-	-	-	-
	Dietetics	14	5	2	-	1	1	1
	Respiratory	1	1	-	-	-	-	1
24th	General	9	3	1	-	1	-	1
	Neonatal	18	1	-	-	-	-	1
	Cystic Fibrosis	8	8	8	-	-	-	-
25th	Diabetes	7	7	4	-	1	-	2
	Diabetes	5	5	3	-	1	1	-
	Dietetics	2	2	2	-	-	-	-
	General	18	3	2	-	-	-	1
	Neonatal	20	1	-	-	-	-	1
26th	Diabetes	4	4	2	-	1	1	-
	Neurology	12	11	2	-	4	3	2
	Dietetics	5	2	2	-	-	-	-
	Ultrasonography	9	2	1	-	1	-	-

Appendix 1 Summary of vaccinations delivered[3]

Date	Clinic	No of Pts	Eligible	Already Vaccinated	N/K	Declined	DNA	Vaccinated
January 2017								
30th	Respiratory	4	4	3	-	1	-	-
	General	18	4	3	-		1	-
	Dietetics	13	5	1	-	1	2	1
	General	9	3	1	-	1	-	1
31st	Coeliac	8	8	2		1	1	4
	General	8	2	2	-	-	-	1
1st	Diabetes	4	4	3	-	1	-	-
	Diabetes	7	7	3	-	2	1	1
	Dietetics	3	3	1	-	-	-	2
	General	8	4	2	-	-	1	1
2nd	Ultrasonography	8	1	-	-	-	1	-
	Asthma	9	9	6	-	3	-	-
	Dietetics	4	4	3	-	-	1	-
	General	10	5	1		4	-	-
	General Dietician	7	4	2	2			
20th	General	19	3	-	-	2	-	-
	Respiratory	6	6	5	-	-	1	-
	Sickle Cell	6	6	4	-	-	-	2
	General	6	4	2	-	-	-	2
21st	General	17	1	-	-	1	-	-
	General	11	2	1		1	-	-
22nd	Diabetes	5	5	2	-	2	1	-
	Diabetes	6	6	5	-	-	-	1
	Total	**668**	**290**	**135**	**8**	**49**	**32**	**58**

Reasons for declining

Patient unwell	19	Unwell on previous year's vaccine	1
Patient declined	6	Egg allergy	3
Parents declined	13	Immuno-suppressed	1
Parents wanted more time to research	3	Wanted vaccine but went home	1
Prefer GP	2	Total	49

Appendix 2 Key components of introducing the delivery of Live Attenuated Influenza Vaccine (LAIV) into a Children's Outpatients department

The table on the right sets out the key resources and components that need to be in place to implement the delivery of the LAIV vaccine in a children's outpatient department. The content of this table reflects the experience of implementing the delivering of LAIV in to the children's outpatients at Milton Keynes University Hospital.

Component	Processes to have in place	Requirements/ actions	Reference resource (see Appendix 5)	MK outpatients intervention
Vaccine	Supply – from Hospital pharmacy sourced through ImmForm.	Pharmacist with ImmForm Account Weekly ordering to avoid vaccine wastage and over ordering Vaccine has short expiry date.		
	Space to store vaccine in designated medical fridge.	Ideally close to place of administration.		
	Maintenance of cold chain.	Designated individual(s) or automated process to take daily recording of fridge temperature Process in place to respond to a cold chain incident if arises.	Protocol for ordering and storing vaccines HPA vaccine incident guidance.	
	Space to give	Quick access to adrenaline in case of anaphylactic reaction Ability to follow procedure for disposal of vaccine vial.		Creation of a influenza trolley as outpatients not close to a clinical area.
Process of giving the vaccine	Patient Group Direction	Needs to be authorised by hospital trust / adopted locally All nurses working under this PDG must be trained in the use and sign a copy.	National template for a PGD	Enthusiastic pharmacist who fast tracked process of local adoption and trained staff in working under a PGD.
	Parental consent	Serves as way of demonstrating the process of consent has occurred.	National template	Modified national template to specifically cover possible contraindications.
	LAIV contraindicated	Way to inform patient's GP if LAIV is contraindicated and IM influenza vaccine needs to be given.		Letter generated from PharmOutcome for patient's GP.
	Second dose of LAIV required	Way to inform patient's GP that a second dose of LAIV is required 4 week after the dose administered.		Letter generated from PharmOutcome for patient's GP.
	Documentation that LAIV has been given	All required parties informed: Parent held record (red book if brought), hospital notes, PharmOutcomes to notify GP and CHIS. Establish process to link with payment if agreed. Parent aid memoir if red book not brought.		App developed for use with PharmOutcome This generated letter for GP MK did not seek payment for administering vaccines.

Component	Processes to have in place	Requirements/ actions	Reference resource (see Appendix 5)	MK outpatients intervention
Identification of possible children	Clearly defined cohort of which children to be offered LAIV.	Specified within PGD Identifying these children prior/within clinic. Notifying parents that they child will be offered LAIV.		Clinic list reviewed prior by nurse. Posters placed in clinics. Parents approached. If project repeated will consider incorporating within letter re clinic appointment that influenza vaccine indicated. Consider identification sticker on notes.
	Checking if vaccine already received	Avoidance of repeating immunisation.		Asked parents and captured on consent form.
Nursing resources	Oversight of implementation process and ongoing project.	Time to designate to project estimated as: 20 hours Children's matron 4 days per week band 5 dedicated influenza nurse Support from paediatric practice facilitator.		Set up and implementation lead by children's matron and paediatric practice facilitator. Oversight lead by band 5 nurse 0.8wte.
	Training of nurses	Knowledge of overall influenza programme, contraindications, competent in administration, Familiar with working under a PGD.	PHE online training Tap into local training provision PHE childhood influenza programme training slide set for health care professionals.	1 ½ hr face to face training with local immunisation nurse specialist/Oxford AHSN network nurse. Completion of PHE online influenza training components related to LAIV Pharmacist trained nurses to work under a PGDs.
Establish relationships with key stakeholders	Hospital Pharmacist Hospital PDG lead Influenza lead in local NHS screening and immunisation team PharmOutcome provider.			
Process to evaluate implementation	Methods to capture vaccination related data. Resource to evaluate data.	Identification of potential eligible cohort of children. Recording already received/given/refused and reason why. Record of nursing time input.		For each clinic data sheet completed (see appendix 1) Collaborated with Oxford AHSN children's network to write up pilot project.

Appendix 3 Timeline to initiate key components of setting up a service to deliver LAIV in Children's Outpatients Department

Component	Task	Set up stage			Vaccination stage					
		June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb
Establish relationships with key stakeholders	Hospital Pharmacy	X								
	Hospital PGD lead	X								
	Influenza lead in local NHS screening and imms team	X								
	PharmOutcome Provider	X								
Vaccine	Secure supply				X					
	Space to store in maintained coldchain	X								
	Space to give				X	X	X	X	X	X
	Patient Group Direction	X	X							
	Consent Form		X							
	Process to record vaccine given		X							
	Process to inform key stakeholders child has been vaccinate		X							
Identification of possible children	Include information in clinic invitation letters	X	X	X	X	X	X	X	X	X
	Review of clinic lists				X	X	X	X	X	X
Nursing resources	Project management and oversight	X	X	X	X	X	X	X	X	X
	Training of nurses administering vaccine			X	X					
Evaluation process	Process to capture number eligible				X					
	Process to capture number vaccines given				X					
	Process to capture number of refusals				X					
	Data Capture					X	X	X	X	X
	Project writeup									X

Appendix 4

Milton Keynes University Hospital NHS
NHS Foundation Trust

Flu Immunisation Consent Form

Parent/guardian to complete

Patient details		
Label	Parent/guardian phone number:	GP name and address:

Please tick applicable boxes	Yes	No	N/A
Has your child already had a flu vaccination since September 2016?			
Has your child ever had a flu vaccination? If so, when?			
Does your child have a disease or treatment that severely affects their immune system? (e.g. treatment for leukaemia)			
Is anyone in your family currently receiving treatment that severely affects their immune system? (e.g. they need to be kept in isolation)			
Does your child have any allergies? (E.g. gentamicin, gelatine, eggs, sucrose etc.)			
Is your child receiving salicylate therapy? (e.g. aspirin)			
Is your child pregnant or breastfeeding?			
If you answered **Yes** to any of the above, please provide details:			

Please tick applicable boxes	Yes	No	N/A
Has your child been diagnosed with asthma?			
If **Yes**, and your child is currently taking inhaled steroids (i.e. uses a preventer or regular inhaler), please enter the medication name and daily dose (e.g. Budesonide 100 micrograms, four puffs per day):			
If **Yes** and your child has taken steroid tablets because of their asthma in the past two weeks please give details:			
Please let the immunisation team know if your child has had to increase his or her asthma medication after you have returned this form.			
On the day of vaccination, please let the immunisation team know if your child has been wheezy in the past three days.			

NB. The nasal flu vaccine contains products derived from pigs (porcine gelatine). There is no suitable alternative flu vaccine available for otherwise healthy children. For more information on the flu vaccination programme, go to: **www.gov.uk/government/collections/annual-flu-programme**

Consent for immunisation (please tick **Yes** or **No**)	
☐ **Yes**, I consent for my child to receive the flu immunisation.	☐ **No**, I DO NOT consent to my child receiving the flu immunisation.
If **No**, please give reason(s):	
Signature of parent/guardian (with parental responsibility):	Date:

Milton Keynes University Hospital NHS
NHS Foundation Trust

Flu Immunisation Consent Form

For office use only

Pre-Session Eligibility Assessment for Fluenz Tetra

Eligible Patient Group:	**Yes**
Age (born between 01/09/11 - 31/08/14)	
Chronic Heart Disease	
Chronic Renal Disease	
Chronic Liver Disease	
Chronic Neurological Disease (including learning difficulties)	
Diabetes Mellitus	
Chronic Respiratory Disease	
Asplenic or Splenic Dysfunction	

Assessment Completed By or Discussed With:	
Name & designation	
Signature	
Date	

Eligibility Assessment on Day of Vaccination

	Yes	**No**
[1]Has the parent/child reported the child being wheezy over the past three days?		

If the child has asthma, has the parent/child reported:	**Yes**	**No**
Use of oral steroids in the past 14 days?		
An increase in inhaled steroids since consent form completed?		
The child feeling unwell with heavy nasal congestion, fever or acute severe systematic illness?		

	Yes	**No**
Has the child received any antiviral medication in the last 48 hours such as Tamiflu (oseltamivir)/Aciclovir?		
If **Yes**, postpone vaccine & return to GP for vaccination.		

	Yes	**No**
Child eligible for Fluenz Tetra		
Reason (If child **is not** eligible give details):		

Assessed and Administered By:	
Name & designation	
Signature	
Date	

Vaccine details	
Date	
Time	
Batch number	
Expiry date	

[1]Asthmatic children not eligible on the day of the session due to deterioration in their asthma control should be offered inactivated vaccine if their condition doesn't improve within 72 hours to avoid a delay in vaccinating this 'at risk' group.

Appendix 5 Online resources

1. Protocol for ordering and storying vaccines
   www.gov.uk/government/uploads/system/uploads/attachment_data/file/300304/Protocol_for_ordering__storing_and_handling_vaccines_March_2014.pdf

2. Vaccine Incident guidance
   www.gov.uk/government/publications/vaccine-incident-guidance-responding-to-vaccine-errors

3. PHE Live attenuated influenza vaccine (Influenzaenz Tetra®): patient group direction (PGD) template
   www.gov.uk/government/publications/influenza-vaccine-influenzaenz-tetra-patient-group-direction-pgd-template

4. NHS England Midlands and East (Central Midlands) Patient Group Direction for the administration, or supply in specifically defined circumstances, of Live attenuated influenza vaccine (LAIV) nasal spray suspension: Influenzaenz Tetra® Children and adolescents aged 2 – less than 18 years
   www.england.nhs.uk/mids-east/wp-content/uploads/sites/7/2016/09/sipgd-004-laiv-v3.pdf

5. Influenza vaccination consent form template
   www.gov.uk/government/publications/influenza-vaccination-consent-form-template

6. E- Learning for health care influenza immunisation
   www.e-lfh.org.uk/programmes/influenza-immunisation/

7. Childhood- influenza- programme training slide set for health care professionals 2016/17
   www.gov.uk/government/publications/childhood-influenza-programme-training-slide-set-for-healthcare-professionals

Oxford AHSN and the children's influenza vaccination programme

Oxford Academic Health Science Network

www.oxfordahsn.org

Magdalen Centre North,
1 Robert Robinson Avenue, Oxford Science Park, OX4 4GA, United Kingdom

t: +44(0) 1865 784944 **e:** info@oxfordahsn.org

Follow us @OxfordAHSN
Follow us @OxAHSNChild