

Early View

Correspondence

Mobile video Directly Observed Therapy can be used to improve at home inhaler technique in children with asthma

Michael D Shields, James McElnay

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Title

Mobile video Directly Observed Therapy can be used to improve at home inhaler technique in children with asthma.

Michael D Shields ^{1,2}

James McElnay ³

¹ Medicine, Dentistry and Biomedical Science, Queen's University Belfast

² Royal Belfast Hospital for Sick Children

³ Pharmacy, Faculty of Medicine, Health and Life Science, Queen's University Belfast

Corresponding author

Michael D Shields

Centre for Experimental Medicine, Wellcome Wolfson Institute of Experimental Medicine, Queen's University Belfast, 97 Lisburn Road,
BT9 7BE, Belfast, N.Ireland, UK

Email: m.shields@qub.ac.uk

To the Editor:

We were very pleased to read the article “Comparison of inhalation technique with the Diskus and Autohaler in asthmatic children at home” recently published in the *European Respiratory Journal Open Research* [1]. In that paper the authors describe using video Directly Observed Therapy to detect children’s errors when using their inhalers at home. This is very important and clearly shows that paediatricians and asthma specialists can wrongly assume that if a child can demonstrate correct inhaler technique at the clinic they will continue to use correct inhaler technique when at home. The authors also report that errors were more frequent when the dry powder diskhaler was compared with the autohaler.

We have previously developed remote, mobile device, video Directly Observed Therapy (vDOT) as a tool to use in our difficult to treat asthma service. We carried out a study using vDOT for a group of children referred as potentially needing biological anti-asthma therapy. We asked the children to submit videos each time they used their preventer inhalers over a 6 week period as we needed to know that the children had both taken their inhaled preventer (adherent) and taken the inhaled medication correctly (good inhaler technique) (2). Despite having given the children clear training in correct inhaler technique prior to using the vDOT we were surprised to find that in the first week of vDOT only 20% of children in the study demonstrated correct inhaler technique. We found an excellent feature of using vDOT was that the asthma nurses were able to immediately provide corrective action by contacting the children/parents immediately and by 5 weeks all children were using their inhaler correctly. After the period of vDOT asthma control in the children had improved and none needed an expensive biologic anti-asthma therapy.

Indeed, we have integrated the use of vDOT within our regional Difficult Asthma service care pathway (3) and Figure 1. The results from an audit on implementation of the vDOT programme into routine practice has shown a dramatic reduction in the number of children who require medication escalation to biological medications, i.e. in the 48 months ahead of full implementation of vDOT some 17 asthma children within N. Ireland were escalated to biologics while over the 48 months with vDOT implemented that number had dropped to 2 patients.

vDOT has been used within our Difficult to Treat Asthma care pathway ~~to~~ 1] to ensure a period of optimised care has been delivered (with correct inhaler technique and regular medication use /adherence, (3,4)), 2] to enable the asthma nurses to support children/parents who are having difficulty mastering the correct use of an inhaler – the asthma nurses are able to view uploaded videos and provide day to day support to enable the child to develop correct inhaler technique over a few days and weeks via the vDOT platform, 3] to support the FeNO suppression test (5) and importantly, 4] to monitor adherence and nasal spray technique in children requiring allergic rhinitis treatment. When a child who is not enrolled for vDOT attends the asthma clinic and has an elevated FeNO it is difficult to know whether the child needs additional steroid therapy or simply to start taking the current prescribed inhaled corticosteroid correctly. If, using the same medication

regimen, the FeNO suppresses after a 5-7 day adherent period, supported / validated by vDOT then the likely problem has been non-adherence or incorrect inhaler technique.

We believe that the paper published in ERJ Open Research (1) and our study (2) suggest that the use of vDOT provides another approach or tool to improving asthma control that may be preferable to, or additional to, the use of electronic inhaler device monitors (5).

The advantages of the vDOT approach include 1] being device independent, 2] facilitates immediate corrective action (via the vDOT platform), 3] can be used to assess treatments for allergic rhinitis (both adherence and nasal spray technique) and 4] provides monitoring of both correct inhaler technique and adherence (each inhalation is stamped with time/date).

Overall we believe that the use of vDOT as described in this paper could not only be incorporated in Difficult Asthma Care pathways but also facilitate further research into how people use inhalers over time. This could lead to improved ways of training children to mastery of inhaler technique so that correct inhaler technique at home is assured.

Competing interests

The authors launched (January 2017) a commercial enterprise to develop and market a vDOT solution (www.continga.co.uk).

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**RBHSC Difficult to Treat
Asthma clinic**

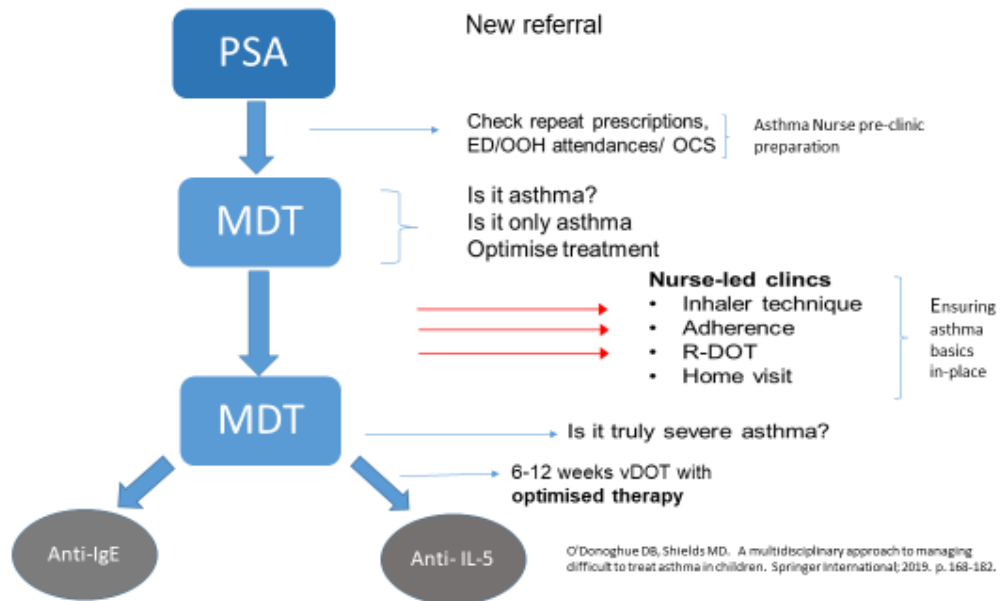


Figure 1. This figure gives the outline to the approach taken by the RBHSC regional Difficult Asthma clinic.

PSA = Problem Severe Asthma, MDT = multidisciplinary Team, vDOT or R-DOT = video or remote Directly Observed Therapy, RBHSC = Royal Belfast Hospital for Sick Children, ED = Emergency Department, OOH = Out of Hours, OCS = Oral Corticosteroids