

## **Product Review**

# **Evaluation of the “ditto™” for pediatric procedural support**

Brenda Gordley and Charmaine Kleiber

### **Models:**

ditto™ (Product code DIT\_V2) \$2,910 USD

ditto™ lite (Product code DL\_Lite) \$890 USD

[www.dtt.net.au](http://www.dtt.net.au)

Cost includes one year support.

Diversionary Therapy Technologies (DTT) markets novel hand-held electronic devices for enhancing pediatric psychosocial procedural support for children in medical and dental settings (1). Support is achieved by use of interactive, intuitive, multimodal, sensory based distraction. The waterproof ditto™ was originally designed for use during burn wound care procedures. The ditto™ lite is the next generation of the ditto™ device. It is water resistant and lighter than the original device, while still providing the same programming. Programs are available in both Spanish and English. Both devices provide psychosocial preparation for procedures such as injections, dressing changes, dental work, IV placement, radiology studies, and burn injury treatment. In addition games and other distraction novelties may be accessed on the device for distraction intervention. Preparation information is presented in animated vignettes specifically created to meet the needs of the targeted age group (preschool and early school-age). The games for distraction incorporate elements that target engagement of the young child.

### **Scientific evidence**

The information given on the Diversionary Therapy Technologies home page is different depending on which language (country) is chosen. We accessed the home page designed for the United States. One of the pull down tabs, Clinical Trials,

lists the titles of 6 publications, but not authors or journals. It also has a chart comparing aspects of the ditto™ with the iPad. Interestingly, accessing the home page after selecting Australia gives different information under Clinical Trials. The full citations and abstracts are listed, but the comparative chart with iPad is missing. This review is limited to the information given for users from the United States.

All of the publications and trials listed are generated from the same group in Queensland, Australia. Mott et al. (2008) described a prototype for the ditto™ product. The device was tested with 42 children, aged 3-14 years, randomized to the prototype group or basic multidimensional cognitive techniques. Pain was measured with FLACC scores for children 3 to 4 years old, the Faces Pain Scale-Revised for children 4 to 8 years old, and a VAS for children over 8 years. For children undergoing procedures less than 30 minutes there was no significant difference, but for children who had procedures >30 minutes in duration, the prototype resulted in lower mean pain scores (2.81 vs. 5.38;  $p = .01$ ). Children randomized to the prototype also experienced less pain with subsequent dressing changes ( $p < .01$ ).

Miller et al. (2010) compared 2 functions of the ditto™ prototype, the multimodal procedural preparation (MMD-PP) function and the multimodal distraction (MMD-D) function. The two functions of the ditto™ were compared with standard distraction (including toys, caregiver interactions and TV, but not interactive devices) or hand-held video games. Pain was measured at 4 times with the Wong-Baker FACES scale. Participants in this study were 80 children, 3 to 10

years of age. Children randomized to either the MMD-PP (who had access to all of the distraction and calming techniques provided in standard care) or the MMD-D groups reported less pain than children in the standard distraction or video game groups. There was not a significant difference between outcomes for the MMD-PP or MMD-D groups ( $p > .05$ ).

Another study by Miller et al. (2011) compared standard care (access to TV, video games, stories, toys and caregiver support) to MMD-PP plus MMD-D. Participants in were 40 children, 3 to 10 years old, being treated for burns. The MMD-PP plus MMD-D group was superior ( $p < .05$ ) for all outcomes including pain intensity, observed distress (FLACC scale), days to healing, and length of treatment.

The published studies provide convincing evidence that the ditto™ preparation and distraction functions decrease self-reported pain in young children. It is not clear, however, that the ditto™ product is superior to other interactive devices. The product home page includes a table comparing the ditto™ to the iPad, making some questionable claims. The ditto™ is described as “clinically proven to reduce stress and anxiety” but none of the studies available for review measured either of those variables. The conference abstract listed on the site, suggests preliminary results that may in fact clinically substantiate the claim of reducing stress and anxiety. However, it appears this information is not yet accessible for critical review, as it has not been published. The iPad is described as not being intuitive or interactive, or having games specifically developed to decrease stress. Our experience with the iPad in our inpatient burn unit is that most children are able to interact with the iPad with little or no instruction. McQueen et al. (2012) reported on several case studies of children in the emergency department who were successfully distracted with iPad applications, and listed 11 representative applications that could be used.

### Ease of use

At first glance, both the ditto™ and tablet devices appear to be fairly straightforward as distraction devices. Both offer interactive applications that can be used to engage the pediatric

patient in distraction. The ditto™ provides clear-cut instructions, and is ready to use out of the box. A novice user can effectively navigate the programs in a child-friendly manner. DTT involved a Certified Child Life Specialist (CCLS) in device training and script development. In our experience with the product, the CCLS was available for consultation via email and telephone. The company also provides customer support, including online updates for the device.

In contrast, tablet devices are literally a *tabula rasa* “blank tablet” when purchased and as such require set-up, often with the assistance of an Information Technology specialist. Applications need to be selected for pediatric appropriateness, downloaded, and organized.

Though initially time consuming to download and set up applications, there is great potential for the tablet to be individualized for use with any age group. Individualization is a key factor for success in the use of psychosocial preparation and distraction in the pediatric population. Ideally, a professional trained in the use of distraction and child development would select applications for use during distraction and in customizing preparation materials. Tablets also accommodate the creation and storage of multiple versions of preparation materials that could be customized to procedure type and child’s developmental level.

While many effective free applications can be downloaded, there is the trade-off of pop-up advertisements. These pop-ups affect the pace of distraction during the time it takes to close the advertisement window. If the child happens to activate a link to a web page on the advertisement, the time may be extended to navigate back to the distraction application. This can impede the child’s focus, potentially contributing to loss of the child’s attention during a critical point in a procedure. Also, all content accessible on the tablet may not be appropriate for the pediatric population. This requires professionals to be vigilant during use if the device is connected to the Internet, as advertisement windows may open at random. One means to limit this interaction is to disconnect Internet access to the tablet. Internet concerns are not an issue with the ditto™.

The growing familiarity of children with tablet devices also poses a challenge. Children often know how to open applications and may do so quickly when the tablet is within reach. Many professionals use folders on the device in combination with behavioral redirection as a means to address this issue.

In correspondence with DTT, the company indicates ditto programming is now available in iPad applications for purchase through iTunes (\$349.99 USD per title).

### Infection control

The ditto™ device is waterproof making it uniquely suited for use during hydrotherapy and other medical procedures with splash potential. Tablets can be covered for use in hydrotherapy, but the ability to interact with the touch screen is altered, and the device is not as effective in those situations. Products for protecting the device from water are available for purchase. The waterproof aspect of ditto™ makes cleaning easy, but tablets can also be cleaned effectively following use in most medical procedures.

### Conclusion

In several preparation scenarios on the website demo and in our experience with the device (during a free trial of ditto™ lite), distraction is not

demonstrated by the characters. This is a lost opportunity to model distraction behavior for the child.

The ditto™ products appear to be effective in reducing pain during burn dressing procedures in young children and may be attractive for institutions that do not have the resources necessary to set up and maintain distraction materials on blank tablets. Additional research on the device is warranted. Specifically, there is a need for impartial study to validate efficacy. Individual hospitals and clinics should examine the ditto™ procedural preparation functions carefully to make sure that they are in agreement with what children would expect locally.

Brenda Gordley, BS, CCLS, RN  
University of Iowa Children's Hospital, North Liberty, IA, USA  
email: [brenda-gordley@uiowa.edu](mailto:brenda-gordley@uiowa.edu)

Charmaine Kleiber, PhD  
University of Iowa, Iowa City, IA, USA

### Author note

Cost estimate provided by DTT following free trial of ditto™ lite in March 2013. Device was made available for trial for 3 weeks, then returned to the company. Postage and handling costs were covered by DTT.

### References

McQueen A, Cress C, Tothy A. Using a tablet computer during pediatric procedures: a case series and review of the "apps". *Pediatr Emerg Care* 2012;28:712-714. [www.pubmed.gov/22766593](http://www.pubmed.gov/22766593)

Miller K, Rodger S, Bucolo S, Greer R, Kimble RM. Multi-modal distraction: using technology to combat pain in young children with burn injuries. *Burns* 2010;36:647-658. [www.pubmed.gov/19889502](http://www.pubmed.gov/19889502)

Miller K, Rodger S, Kipping B, Kimble RM. A novel technology approach to pain management in children with burns: a prospective randomized controlled trial. *Burns* 2011;37:395-405. [www.pubmed.gov/21306828](http://www.pubmed.gov/21306828)

Mott J, Bucolo S, Cuttle L, Mill J, Hilder M, Miller K, et al. The efficacy of an augmented virtual reality system to alleviate pain in children undergoing burns dressing changes: a randomized controlled trial. *Burns* 2008;34:803-808. [www.pubmed.gov/18325675](http://www.pubmed.gov/18325675)