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Strategies parents use to give children oral medicine: a qualitative study of online discussion forums

Elin Høien Bergene^{a,b} , Torstein Baade Rø^{c,d}  and Aslak Steinsbekk^a 

^aDepartment of Public Health and Nursing, Norwegian University of Science and Technology (NTNU), Trondheim, Norway; ^bCentral Norway Hospital Pharmacy Trust, Trondheim, Norway; ^cDepartment of Pediatrics, St. Olav's Hospital, Trondheim University Hospital, Trondheim, Norway; ^dDepartment of Cancer Research and Molecular Medicine, Norwegian University of Science and Technology (NTNU), Trondheim, Norway

ABSTRACT

Aim: The aim of this study was to describe strategies parents use to give oral medicine to children.

Methods: We conducted an Internet-based qualitative study of posts from online forums where parents discussed how to give children oral medicine. The posts were analyzed using systematic text condensation. The investigators coded and developed groups iteratively, ending up with a consensus on final themes.

Results: We included 4581 posts. Parents utilized three main strategies to give oral medicine to children: (1) *Open administration* give medicine to the child knowingly by changing the palatability, actively involve the child in play or use persuasion; (2) *Hidden administration* give medicine to the child unknowingly by camouflaging it in food, while sleeping or distracted by another activity; (3) *Forced administration* force children to take medicine with the use of restraint. Parents expressed three perspectives towards using force: Finding it unproblematic, using force despite not liking it or refusing to use force. No single strategy was described as the obvious first choice, and the strategies were not used in any particular order. Parents who gave up getting their child to ingest the medicine reported to contact the prescriber for a different medication, or stopped the treatment completely.

Conclusions: The three strategies are a robust and precise way to categorize techniques used by parents to give children oral medicine. We suggest that health professionals use the strategies to talk to parents and children about administration of oral medicines.

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Administration; oral; child; preschool; infant; palatability; qualitative research; parents; internet

Introduction

Children's resistance towards oral medication has been documented for more than 50 years [1] and remains problematic today. Medicine refusal is linked to low adherence rates in children, putting them at risk of suboptimal treatment [2,3]. Almost one-third of children with chronic illness have refused their oral medication, largely because of palatability issues such as taste, texture or smell [4]. Children who refuse medicine because of taste have higher genetic sensitivity in bitter taste perception than others [5]. Acceptance of medicine in children may not only be influenced by the taste of the medicine but also how parents administer medicines in the domestic setting. A number of techniques have been reported in the literature, e.g. mix medicines with food/drinks [6–14], positive

enforcement [6,7,9,14,15], persuasion or reasoning [6,10,11,15], involve children [8] or use physical force or restraint [6,7,9,16]. An overview of how parents generally overcome children's refusal, however, is lacking.

Online discussion forums are valuable sources of information about parents' behaviour in relation to children's health [17], including sensitive and taboo issues not easily discussed with family and friends [18]. Furthermore, as parents commonly search the Internet for advice on what to do when their child is ill [19], posts on Internet forums can influence parents' behaviour. The aim of this qualitative study was to identify strategies and techniques used by parents to give oral medicine to children by exploring what parents write about their experiences in online discussion forums.

CONTACT Elin Høien Bergene  elin.h.bergene@ntnu.no  Department of Public Health and Nursing, Faculty of Medicine and Health Sciences, Norwegian University of Science and Technology (NTNU), N-7491 Trondheim, Norway

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Material and methods

We conducted a qualitative study of parental posts on online discussion forums. The study was approved by the Regional Committee for Medical and Health Research Ethics in Central Norway (2014/1743). Although the formal identities of online participants are protected by nicknames, some participants may disclose personal information in their posts. We therefore chose to protect the participants' identity by not disclosing the web address of the discussion forums used and only use translated quotes. All quotes were translated from Norwegian to English by the first author, and checked by the other authors. The quotes were retranslated back to Norwegian using Google translate (translate.google.com) and searched on Google. If the quote identified the post it came from, it was replaced.

Data

We aimed to include all posts from Norwegian online discussion forums where parents discussed how to give children oral medicine. Google (www.google.com) was used as the search engine. Inclusion criteria were descriptions on how parents gave oral medicines to children independent of the child's age, duration of treatment, type of medicine, number of replies or publishing date.

The search strategy was to first identify relevant discussion forums using the Norwegian search terms for 'child', 'medicine' and 'forum'. To improve the exact

text match search, we added terms used by parents: 'liquid', 'drops', 'tablet', 'penicillin', 'antibiotics', 'refuse', 'kids' and 'force' and misspellings such as 'penecilin', 'pencilin' and 'penselin'. Nine different discussion forums were identified (Figure 1). Next the forums were searched individually with the same search terms. When an eligible post was identified, the entire thread (initial post and replies) that this post belonged to was included in the analysis to provide context.

Analysis

The analysis was divided into one detailed analysis and two supplementary analyses (Figure 1). NVivo qualitative data analysis software (QSR International Pty Ltd. Version 10, 2014) was used to import the posts and keep track of the coding. The analysis of the posts was done using an iterative four-step method called systematic text condensation [20]. As an example of the iterative process, the preliminary theme shame and guilt was changed to the strategy 'forced administration' (Table 1).

In the first step, all posts within the threads were read and reread to identify preliminary themes. In the next step, all relevant posts were searched in detail to identify and code meaning units that described the specific techniques used by parents to give children medicine. These were grouped and sorted into the preliminary themes that were named strategies. Third, the content was condensed, and the preliminary strategies and techniques adjusted through several rounds of discussions between the authors. In the last step,

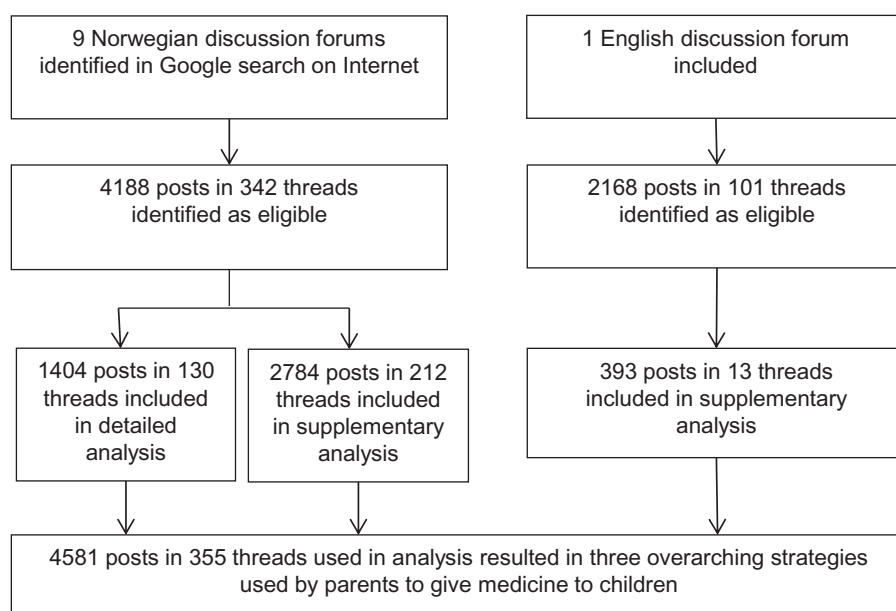


Figure 1. Inclusion and analysis of Norwegian and English discussion forums.

Table 1. Example of the iterative analytical process.

Step 1	Step 2		Step 3		
	Identify meaning units	Preliminary strategy	Condensate	Adjust techniques	Adjust strategy
Preliminary theme					
Parents express shame and guilt when they give children medicine against their will	<i>Our boy has used a lot of penicillin and he thinks it's horrible. Sometimes we have forced him. But it feels like child abuse. It hurts inside</i>	Restraint and force	It is in my child's best interest to get the medicine, though I feel mean or that it's horrible to use force against my child	Parents find it unproblematic, uncomfortable or unbearable to force the child to take medicine	Forced administration

we summarized the contents of each preliminary strategy to generalize how parents gave oral medicine to children. This resulted in describing three overarching strategies.

The remaining posts from the Norwegian discussion forums were included in a supplementary analysis where each post was read carefully, specifically looking for new techniques or strategies to add to the findings from the detailed analysis. No new techniques or strategies were found. To increase the findings' generalizability outside Norway, we also included posts from a large English online parental discussion forum using the same procedure as for the Norwegian forums. Screening the posts for eligibility gave the impression that the threads were very similar to the Norwegian forums. We therefore stopped after identifying 101 eligible threads with 2168 posts. The threads were randomized, and 393 posts in 13 threads were analyzed in detail. Giving the medicine while sleeping had previously been identified in the Norwegian forums but was given more importance as one thread from the English forum described this more extensively. As no new techniques or strategies were found, we stopped the inclusion of new threads in the analysis.

Results

We analyzed 4188 posts in 342 threads published during 2002–2015 from the Norwegian forums and 393 posts in 13 threads published during 2008–2015 from the English forum. Due to a number of parents not choosing a unique nickname and therefore assigned the default (e.g. 'anonymous') as nickname, we were unable to estimate the number of participants included.

Parents started threads on online discussion forums by asking other parents for advice on how to give their children medicine. They described situations where despite trying several different techniques, the children would scream and cry, refuse to open their mouth or swallow, spit out or vomit the oral medication. Other parents replied to these postings and

shared their techniques of giving medicines to children. We categorized these techniques into three main strategies based on the interaction between the parent and child: Open administration, hidden administration and forced administration (Table 2). In addition, we examined parents' actions when their strategies did not lead to children taking their medicine.

Open administration of medicine

The strategy *open administration of medicine* implied that the children knew they were given medicine, and this was the most common strategy discussed in the postings. Some parents, however, disliked open strategies because it led to power-struggles with their children. The open administration techniques used by parents were categorized as: Changing the palatability of the medicine, giving the child an active role e.g. through play and use of persuasion. Parents wrote that the child needed to be of a certain age and developmental stage for the different techniques to be successful. Although an explicit age was not always mentioned in the postings, some indications can be given. Parents reported involving children and using play from the age of 1–2 years. Persuading the child to accept the medicine was considered futile for children less than 2 years, and some parents gave examples of children around the age of 3 and up that accepted the medicine after explanations and negotiations. No particular age was reported for changing palatability of medicines.

Parents described several possible ways to change the palatability of bad-tasting medicines: Give the child ice cream or ice cubes to numb the taste buds, add food colour to make it look more appealing, mix medicines with food or most commonly give strong-tasting food or drinks as chasers after the medicine. Some also mentioned dipping the syringe in syrups, or encourage the child to pinch its nose.

The parents described that giving the child an active role when taking medicine was a good way to avoid refusal. This was, however, considered

Table 2. Strategies and techniques used by parents to give children oral medicines.

Strategy	Technique	Example/quote
Open	Change palatability Taste, smell, colour and temperature	<i>We crushed pills with banana and Nutella. She ate ice cream first to numb the taste buds and afterwards as reward. It was a hassle to begin with but became easier with time.</i>
	Give the child an active role Involve the child and use play	Do you give it in a cup or with syringe? It was easier to give it in a medicine cup because he could hold it himself. Also popular that the teddy got medicine first. My three-year-old is also on penicillin and this is what we did after half the box was spit out. Me or big sister (6) are vets and he is a tiger. The tiger needs its tiger food so that he can roar like a tiger. The tiger sits on the lap and the vets listens to him with big sister's stethoscope. He gets his medicine in two rounds and roars afterwards. Then he gets pineapple juice and two chocolate buttons as reward. Sounds stupid, I know ...but it worked here.
	Persuasion Reward/bribe Threats	If they retch when you force it into them, you can use my bribery tips for emergencies. I have used it twice and it worked both times. When he was 2 he was getting antibiotics and was too young to understand why. So I prepared the antibiotics and a small cup with chips. The chips were on the table so that he could see it. He understood right away. After some sulking he took the antibiotics and got some chips as reward. I'm sure some find this despicable, but with a bad chest cough, I thought it was well worth it, and he hasn't nagged about getting chips afterwards. My oldest boy took the medicine voluntarily after telling him that he was ill, and that he had to go to the hospital if he didn't take it.
Hidden	While sleeping	I give it during the night, but I don't wake up the little one, only squirt it in while he is asleep and it has gone really well
	While child is distracted	I sneak up behind them while they are preoccupied with other activities. I did this at the doctor's office when the little one was ill, and they needed to give her an expectorant. The doctor was impressed with my speed. The child didn't even have time to scream.
	In food/drink	Crush it in yoghurt, without him seeing you, and enjoy while he is eating it. Works well her. Have also mixed it with jam on a sandwich. The trick is not to let the kid see it and pretend like everything is normal.
Force	Parent find it unproblematic to use restraint	I don't think it is child abuse to restrain a child, but to stop giving the medicine is certainly not in the best interest of the child. When you restrain the child to give medicine, a doctor told me that you need to hold on so tight that it can be done quickly without the child moving around so that all the medicine goes down. Give the medicine with a syringe. This way the child gets the medicine and it discovers that there is no use arguing. What I did (after trying everything else) was to put him on the floor, sit on top the arms and stomach (not so it hurts, of course), hold the head and squirt in the medicine. The refusal stopped after a few times of doing this.
	Parents are uncomfortable using restraint	Same problem here with ephedrine. So here we are evil (at least it feels like it). She is restrained using force and we squirt it so far back in her mouth so that she cannot choose to swallow or not. Then we cover her mouth while she swallows. Hate it!
	Parents find it unbearable to use restraint	In the end it got so bad I had to give up. I almost sat on him to get the syringe in his mouth. Really bad. He didn't go to daycare at that time, so I decided to just wait and see what would happen. Went to the doctor two weeks later, and the infection was gone. The doctor said that the body usually fixes itself, but because of daycare, etc., you have to speed up the process.

demanding both in time and in creativity. Children were given a choice between taking the medicine in a cup, spoon or syringe, helped shake the bottle or pushed the plunger on the syringe themselves. Although only mentioned in a few threads, there were examples of successfully involving the child by giving 'medicine' to a toy or initiate role-play.

We have learned to use PLAY to get the child to take [the medicine], dependent on what the child is interested in. Today I have four times said that you are a veeery sick sheep, come under the table and you will get your horrrrrrrible grassmedicine – and afterwards a glass of sheep milk – and then we just play [the medicine] in.

The third technique in the open strategy was the use of persuasion. Bribes, rewards, festivities as well as threats were described to increase the child's cooperation. Gifts, sweet tasting food/candy or drinks as well as toys were common bribes and rewards. This was offered with or without negotiation. Threatening the child with removal of toys or privileges such as playing computer games or that they had to go to the hospital if they did not take the medicine was also reported by parents as successful. From the postings, it was apparent that some parents feared criticism or even 'breaking a taboo' by telling that they would use bribes and rewards, and especially sweets.

Some parents included healthy alternatives such as raisins, grapes or vitamin pills when advising others on this strategy.

Tempt with candy! It worked here. I explained that every time he took the medicine, he'd get a wine gum. When the bottle [of medicine] was empty, he could choose a toy in the store. I am actually against using rewards, but this penicillin treatment was so important that I had to give in.

Hidden administration of medicine

This strategy meant that the parents hid the medicine from the child so they would take it without knowing. Administration of medicine was done using three techniques: most commonly by hiding the medicine in appealing, strong-tasting food or drinks but also while the child was asleep or engrossed in play or watching TV. Based on the children's age reported by parents in the posts, they most commonly tried to hide medicines for younger children up to age 2–3.

Parents shared tips of food or drinks suitable for camouflaging medicines, often found through trial and error. Other parents wrote that they had contacted the pharmacy or prescriber for a different formulation that could be camouflaged better.

We asked for pills. Then we just put it in a spoon of yoghurt and he didn't notice. Painless and fine.

Some parents wrote that it was wrong to trick children by hiding the medicine as it could betray their trust if the children found out. Some also wrote that camouflaging unpalatable medicines such as penicillin V or flucloxacillin could never succeed. Parents also worried that that mixing the medicine in food or drink could lead to a reduced effect, ingestion of an uncertain dose of medicine or create an aversion against the food it was mixed with.

Use of force to administer medicine

The third strategy was the use of restraint and physical force. Parents wrote that they would restrain the child's arms, legs and/or head, and force the medicine into the back of the throat with for instance an oral syringe to trigger the swallowing reflex. Pinching the nose, blowing in the face or wrapping the child in a blanket were other techniques described. Parents used force until an age where children became too strong to restrain, or understood open strategies. This was exemplified at 3–5 years, but one parent said it would use restraint even at age 6 if the child refused to cooperate. Parents who used force also wrote that

they would give the child a reward such as sweets after the medicine was administered.

Parents had three diverging attitudes towards using force: unproblematic, uncomfortable and unbearable. Parents who found it unproblematic or uncomfortable argued in similar ways why the use of force was necessary. They wrote that young children are incapable of making decisions about taking medicine so you 'do what you have to do' to make them ingest the medicine. It was reported that children often cooperated after being restrained a couple of times. Force was described to be 'in the child's best interest', based on recommendations from health professionals, and that stopping the treatment could lead to antimicrobial resistance.

My doctor has said I have to be brutal with the children if they refuse to take their medicine. I was told to put the child on its back, squirt it with a syringe and pinch the nose. That way the child has to swallow. Brutal and I feel mean, but it works.

Parents who found using force unbearable clearly stated that they refused to (continue to) use force. They described force as *traumatic* and compared it to *torture*, stating that the child was *traumatized*, *scared to death* and *hysterical* after being forced to take medicine. Parents expressed worries that the child would lose trust in them or even be physically harmed by aspirating medicine into their lungs due to distress.

... the only way we can [administer the medicine] is to force it in her, hold her arms and legs and squirt [the medicine] in... It is the worst thing I have done in my entire life. She cries and is scared to death. Tonight she was so scared she started hyperventilating and I don't want to do this anymore (...)

Handling children's persistent refusal

Some parents described that they were willing to induce discomfort and used many different strategies to overcome children's refusal before resigning. Other parents wrote that they gave up after the first failed attempt. Parents who gave up getting the child to ingest the medicine most commonly contacted the prescriber for a different medication, although some parents wrote that they stopped the treatment completely.

Some parents who wrote about changed antibiotic prescriptions reported that they did not want to stop the treatment as this could cause antibiotic resistance and/or the child would not get the necessary treatment to get better from their illness. The prescription was commonly changed from unpalatable narrow-

spectrum antibiotics to more palatable broad-spectrum antibiotics.

The stupid doctor gave me penicillin. 5 ml 4 times daily made me feel like a tormentor. Got a tip here to change to amoxicillin, and that went much better. 2 ml, 3 times per day, and with much better taste. So ... if you have a stupid doctor giving you penicillin, change!

Changes between liquid and solid formulations due to children's refusal were also reported, and the age when parents considered it appropriate to prescribe solids varied. Some parents wrote that their child could swallow tablets from age 2 to 3, and recommended to change from liquid to solid to increase acceptability. Others stated that even age 5 was too young for being prescribed solids and recommend changing to liquid formulation.

Parents described three reasons for completely stopping the child's treatment: The first two were commonly seen together, stopping due to improvement of the child's symptoms and believing it was wrong to make the child take the medicine against its will.

I have to hold him down and squirt the medicine ... I feel like I am abusing him, and I don't want to do it anymore. I stopped giving the medicine and I really hope it will cure itself ... My poor boy, it hurts me that he is so afraid of something his own mother is doing against him ...

The third reason was a parent not agreeing with the prescriber that the child really needed the medicine.

(...) and when he is not getting the prescribed dose and it is so traumatic, I don't think it is worth it. Ear infections recover on their own, and antibiotics do not alleviate the symptoms themselves, in addition, they can cause side effects. Public health information says that it is only necessary with antibiotics for every 15th ear infection. So I'm a little skeptical of the necessity of antibiotics. Symptoms can be alleviated by other remedies. I agree with [another parent] that doctors prescribe antibiotics too often. They really want to provide a solution.

Based on the overall impression from all the postings, it seemed like most parents would try out different strategies and techniques for a limited period of time. However, it was clear that there was no single strategy that was described as the obvious first choice, and the strategies were not used in any particular order.

Bribe, tempt, trick, persuade, convince, sweet talk, explain and negotiate. I use all of these, in addition to sometimes forcing. It is my duty. I am the mother and I have to decide.

Discussion

Parents utilized one or more of three main strategies to give oral medicine to children: (1) *Open administration* give medicine to the child knowingly by changing the palatability, actively involve the child in play or use persuasion; (2) *Hidden administration* give medicine to the child unknowingly by camouflaging it in food, while sleeping or distracted by another activity; (3) *Forced administration* force children to take medicine with the use of restraint. Parents unable to administer the medicine to their children would ask the prescriber to change the medicine, or stopped giving it.

Strengths and limitations

An apparent strength of this study is that our targeted searches of online forums allowed us to identify a large number of techniques used by parents to give oral medicines to children. The same techniques and the same type of experiences that parents found uncomfortable were reported in the Norwegian and English forums. This supports previous findings of online forums being suitable for exploring sensitive issues [18].

Limitations of online forums include lack of contextual information about the participants and the situations described, and not having the possibility to ask questions to further explore topics in detail. Previous studies have, however, found that data from interviews and online forums have comparable naturalistic descriptions [21]. The typical online parent has been described as a white, middle class, first-time mother under 35 years [17]. This fits with the general impression of our participants, but there were examples of posts from other social groups, parents with multiple children and fathers. There were thus clear indications of some diversity among the parents in the study.

Categorization of techniques into strategies

This study gives a unique description of the range in creativity parents employ to get children to take their oral medicine. We categorized the techniques used by parents into strategies according to the parent-child interaction, as interactions between children and caregivers are known to shape how medical procedures are experienced [22]. Previous descriptions of techniques used by parents in other articles [6-16] were readily categorized into the three main strategies as long as the articles gave enough details about the parent-child interaction. The challenges arising from lack of detailed information were of a type similar to

the technique being described as ‘mixing it with some food to disguise the taste’ [10] which could be categorized as open or hidden administration dependent on whether the child knew that the medicine is mixed in the food or not. We take the successful exercise of categorizing techniques described by others as support of the strategies as a robust and precise way of categorizing techniques used by parents.

Parental concerns leading to lack of adherence

Parents who stopped giving the treatment to the child or changed to a different treatment concluded that the discomfort of giving the medicine outweighed its benefit, while the opposite was found for parents who continued the treatment. These findings are in line with a review that found a significant association between patients’ treatment concerns and reduced odds of adherence [23]. Thus, it is likely that parental concern related to the discomfort experienced when giving children medicine may influence adherence rates [24]. It is believed that appropriate support from health professionals can improve the use of medicines in children [25]. Addressing both the necessity of the treatment and how to give the medicine to the child are therefore key points that health professionals should prioritize when communicating with parents about medicines for children.

How can knowledge about strategies be used?

We suggest that health professionals use three successive steps when addressing the administration of oral medicine, inspired by shared decision-making [26]: (1) Ask parents which techniques they know of or have used previously and found successful, unsuccessful or uncomfortable. Parents in this study wrote that successful techniques might not work for different siblings or for the same child at different ages. (2) Inform parents of the three strategies and identify their preferences. (3) Give parents specific examples of techniques based on their preference, and discuss relevant choices with them.

Helping children accept the medicine will reduce the discomfort of both parents and children. Play was reported as a way to give medicine with minimal discomfort, even to infants and young children. We therefore encourage parents and health professionals to involve children and use play actively when administering medicines. Play is considered the language of children, and is used to help children of all ages cope with medical situations [27]. By providing a shared focus for the child, parent and health professional,

play can shift the attention away from the discomfort of medical treatment and create a potential for positive caregiver–child interaction [28]. In addition to being used by parents in our study, play has been found to motivate children to accept topical treatment [29] and inhalations [30].

Conclusions

The three strategies are a robust and precise way to categorize techniques used by parents to give children oral medicine. As discomfort related to giving medicines to children may lead to non-adherence, we suggest that health professionals use the strategies when discussing administration of oral medicines with parents and children.

Ethical approval

The study was approved by the Regional Committee for Medical and Health Research Ethics in Central Norway (2014/1743).

As the parents who posted on the website were anonymous to the researchers, consent to participate was unobtainable.

Disclosure statement

The authors have no real, potential or perceived conflicts of interest relevant to this article to disclose.

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Notes on contributors

Elin Høien Bergene is a PhD student at NTNU. She is trained as a pharmacist and has worked in hospital pharmacies and clinical pediatric settings. Her research interests include acceptability and administration of medicines for children.

Torstein Baade Rø is an associate professor at NTNU, and has worked as a pediatrician for 18 years at St. Olav’s Hospital. His research topics include childhood cancer as well as medication to children.

Aslak Steinsbekk is a professor in behavioural sciences in medicine and health service research at NTNU. He leads a

research group for health service research, patient education and user involvement.

ORCID

Elin Høien Bergene  <http://orcid.org/0000-0003-2871-4315>
Torstein Baade Rø  <http://orcid.org/0000-0002-5258-500X>
Aslak Steinsbekk  <http://orcid.org/0000-0001-9090-0739>

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