

## SOME TIPS TO IMPROVE ACCELEROMETER WEAR TIME

Thanks to: *Kathryn H. Schmitz*

### a. Strategies to Improve Compliance to Accelerometer Wearing Among Youth

Strategy	Comments
<p>Make a personal connection with participants</p>	<p>Making a personal connection with the participants was acknowledged on the conference call as likely the single most important possible action for improving compliance to monitor wearing. Multiple researchers commented that making a personal connection with the participants improved compliance to monitor wearing. It was acknowledged that the ability to do this varies with sample size, study resources, and study design. Visits to participants' homes are recommended when sample size, resources, and study design permit.</p> <p>A quote from Jim Dollman: "... the children tend to respond positively if they see that there is nothing to fear, and if they actually like the researcher(s) after meeting them personally - a fundamental feature of human behaviour, really!"</p>
<p>Make a personal connection with teachers and parents</p>	<p>Parent, teachers, coaches, and referees should know that participants are wearing the monitors and be convinced of the importance of accelerometer wearing to the study. These adults need to be recruited as "helpers." Without 'buy in' from these adults, participants may be required to remove monitors during some important circumstances (e.g. PE class).</p> <p>Multiple researchers commented that enlisting the parents and teachers in the effort to get youth to wear the monitors was helpful. Be sure teachers and parents know how much the monitor costs. If possible, it is recommended that researchers call the family 2-3 days into the monitoring time. Data are more likely to be missing on weekends - possibly calling on Friday or Saturday might help. One researcher reported success in having classroom and Physical Education teachers distribute, explain, and collect the monitors, as these teachers had greater authority with student participants than the researchers.</p>
<p>Make the monitor and wearing of the monitor socially desirable ('cool')</p>	<p>For children under 10 years of age, making the monitors and/or the belts more fashionable with sequins, beads, or fashion coloring on belts appears to be effective to make wearing the monitors socially desirable or 'cool'. One group has had success with a pouch system to wear the monitors and reported that youth felt it was "cool" to wear the pouch. However, there is an upper age limit for this positive effect. Multiple participants reported that decorating the monitors or belts backfired on them with pre-teens and adolescents. The age above which monitors and belts need to be very plain may vary across sites.</p>
<p>Provide youth with an instruction sheet for wearing/non-wearing times</p>	<p>Youth should be given an instruction sheet about when they should wear the monitor, and when it was acceptable (and appropriate) to remove the monitor (e.g., swimming, bathing). If data collection occurs in a school setting, it is helpful to have students called from</p>

	class to learn about wearing and return of the monitors.
Have a physical presence in the school during data collection time period for school based data collection.	Research team members could be physically present in the schools to oversee compliance, prompt wear and retrieval, etc. Some researchers reported that having a physical presence appears to help with compliance.
Activity logs	A day-to-day log helps to remind participants when to put on the monitor, when to wear it, to wear it all day, and when to remove it. The log is sometimes useful to identify off monitor times or reconcile data that are in conflict with subject IDs. The study logo can be printed on the log. A log used successfully in the Stanford GEMs project is attached to this report. (A big thank you to that group for providing it!). One group calls the log a ‘journal’ and tells participants to treat it like a homework assignment. It was suggested that the information in the log may or may not be reliable, but that the log may help keep participants on task. It was suggested that the log may work better for the younger children than among adolescents.
Repeat wearing for non-compliant participants	Give back monitor for a 2 <sup>nd</sup> round of wearing if participants are non-compliant (some find that participants are more compliant 2nd time around, others do not).
Have children call in to tell researchers when they are putting on the monitor each morning	Matt Mahar reports that with an intervention with overweight 8- to -12-year-olds his group had excellent success (100% compliance) getting kids to wear accelerometers for 5 days by having the children call a number each morning before they left for school. They left a message on an answering machine. Kids in this age group seemed to look forward to making this call. Matt’s research group first tried first to have the program director make these phone calls, but that was not as successful. To quote Matt: ‘Although it’s not intuitive, it seems like putting the responsibility in the hands of the kids to make the phone calls works well. Maybe the kids get some reward out of leaving the message (maybe it’s empowering in some way I don’t understand).’
Use cell phone features with teens	Matt Mahar suggested the following: ‘There may be some way to use the features on cell phones that a lot of high school students have (e.g., a text message that appears at the right time each morning) to remind the students to wear their accelerometers.’
Reminder stickers	Give each participant three stickers and ask them to place one on their dresser, one in the bathroom, and one by the front door so they will see it before leaving the house.
Wear monitor under clothing	Suggest to participants that the monitor be worn under the clothing (though over the underwear is fine). This minimizes fidgeting with it.
Use a clip rather than belt for particularly difficult participants	Wearing the monitor on a clip rather than a belt increases the likelihood that the monitor will be lost and will result in positioning that is probably floppier and more varied than using a belt, i.e., greater intra-subject variation. However, for particularly recalcitrant participants, as ‘worst case scenario’, the clip can be used instead of a belt to entice a specific child to wear the monitor.
Telephone reminder calls	Several groups mentioned making reminder calls for increasing

	<p>compliance to wearing the monitor. This seemed to be useful in situations when the monitors were handed to participants AND when monitors were mailed out. If mailed out, a phone check the day before monitors are to be worn can be made to trouble shoot.</p> <p>One group reported that when they do a not-in-person start date and an in-person end-date, monitors are sent out 1 ½ weeks before the in-person end-date office visit. Then staff call participants 2 days after it was sent out to make sure the participant is wearing the monitor correctly.</p>
Show participants what the data will look like if they DO and DO NOT wear the monitor	Graphical displays of the data help the participants appreciate what the monitor does and politely warns participants that you will know when the monitor is not worn.
Multiple single days rather than multiple consecutive days	Consider using single days (multiple times) rather than consecutive days for hard to work with participants.
Immediate data download and review	If possible, data can be downloaded immediately upon removal. Then if there are too many unusable days, you can show this to participants and ask them to wear the monitor "one more day" or reschedule the entire wearing time if you note that your threshold for days worn was not met.
Use accelerometers and pedometers concurrently	One group had almost 100% compliance when using pedometers with accelerometers concurrently in 8 <sup>th</sup> grade students. The devices were physically attached and participants were asked to record their daily steps on a one-page pedometer log that accommodated all 7-days of monitoring. The act of recording the steps seemed to keep the participants focused on the devices (though some interventionists might see this as a problem).
Monetary incentives	Providing monetary incentives that change with number of days worn (more \$\$ for more days) works, when IRBs allow for provisional incentives
Use caution about alerting coaches about wearing the monitor during sports activities	Don't make too big a deal about wearing monitors during structured PA activities. In one instance, girls didn't wear monitors at all during structured PA perhaps because too big a deal was made at outset of the letter to coaches.
Visit participant homes	When sample size, study resources, and study design permit, visits directly to the participants' homes is reported to increase compliance with wearing and returning the monitors.
Live in Iowa	Kathleen Janz made the following comment: "I suspect being in Iowa helps (with compliance). It's a stable, well educated population." <i>(Couldn't help myself, had to include this... ☺)</i>

### **b. Strategies to Improve Accelerometer Return Among Youth**

<b>Strategy</b>	<b>Comments</b>
Obtain multiple contacts per participant	Collect multiple pieces of contact information on students to facilitate retrieval in situations where recruitment is not from a school or where participants may be transient.
Engrave monitors with return	This will ensure that if the monitor is dropped or lost, the

information & hotline number	person who finds it will be able to get it back to the researcher.
Picking up monitors in person versus mailing in monitors	Picking monitor up in person is preferable when possible. Put the return address requested on all mailings. Invest in priority mail envelopes and postage fees. Have participants put monitor in a courier service envelope and leave it on doorstep. (Note that monitor can get stolen from front doorstep.)
Incentives	One group reports having participants wear an accelerometer with a 'research' pedometer (i.e., drab, gray). Participants were told that they would receive a fancy pedometer (i.e., neon colors) of their choice upon completion of the monitoring. Students were shown these fancy pedometers during recruitment to get them interested in acquiring one. This was observed to assist with recruitment rates, as well as returning of the devices on time.
Contingent incentives	If researchers IRB allows for this, provide an incentive contingent on returning the monitor.
Beware vacations	Ask youth if they will be leaving town during the scheduled wearing time. Do not give monitors to youth who are leaving on vacation.
Remind school staff about monitor return date	School staff can provide additional 'return the monitor on time' reminders to students in situations when data collection occurs in a school setting.
Raffle for return	One researcher reported success with providing incentives specifically for returning monitor on time, including entry into a raffle for \$200. Another researcher reported that entry into a raffle for a bicycle did not appear to help with compliance to timely monitor returns.
Phone call follow-up	If participants mail back the monitor, call on the day it is to be mailed (or the day before it is to be mailed) to remind the participant to put it in the mail and again a few days later if the monitor has not yet arrived. One researcher commented that the longer you wait for return, the less likely the monitor will be returned.
Budget for lost monitors	One researcher recommended budgeting for loss of monitors equal to 1% of the sample (1 lost for every 100 subjects). Multiple researchers commented that % lost ranged from less than 1% to 5%, depending on the population under study.

## STEWART TROST'S STRATEGIES TABLE

The following table was developed by Stewart Trost as part of his paper resulting from his presentation at the University of North Carolina-Chapel Hill conference on accelerometry from December 2004. Dr. Trost provided this table via email.

Compliance Strategies	Comments
Ask participants to complete an activity monitoring log.	Participant records the time the monitor is on and off, in addition to recording activities performed without the monitor, or activities known to be insensitive to accelerometry. The log is typically very useful for data analysis and reduction. Completing the log on a daily basis can serve as a valuable self-monitoring tool.
Make reminder calls	At least one phone call to remind participants to wear their accelerometer and to ask about problems/barriers. In school-based studies, this could be done in the classroom. This is an effective and cost-effective strategy and the proliferation of cell phones and text messaging makes this an attractive option.
Provide participants with tips or lists of frequently asked questions (FAQs) about wearing accelerometers correctly.	Can be in the form of tip sheets or flyers disseminated at initial appointment. Email, websites, and voice and text messaging also may be good dissemination options. Tips or FAQs can be easily included in an activity monitoring log booklet where participants are provided with a new tip or reminder each day.
Apply "relapse prevention model" to the problem of not wearing the accelerometer.	Before the monitoring period, identify situations where participants will encounter barriers to wearing the model. Device solutions or plans to overcome barriers, such as wearing under clothes.
Display written materials/ flyers displayed on bulletin boards or refrigerators to prompt wearing the monitor.	Place colorful attention-grabbing flyers, refrigerator magnets, stickers in locations where participants will see them on a daily basis. Include reminder statements such as, "Are you wearing your activity monitor"?
Provide advance notice of the study to employers, teachers, coaches, referees, and other sports officials and educate them about wearing protocols.	In certain situations, participants may be asked to take accelerometers off to conform to dress code or uniform regulations. This is a common occurrence in youth sports. In many situations, such as action is unnecessary. To avoid this problem, communicate with officials before the study and educate them on the process.
Show participants an example of output to show that you can tell when they are not wearing them.	Although care should be taken not to intimidate or coerce participants, showing them a sample output as part of the pre-study education process can promote greater accountability.
Provide incentives contingent on compliance, such as money, gift certificates, coupons, extra credit.	Participant compensation is frequently employed in studies as a compliance strategy. Incentives and standards to receive the incentive need to be appropriate and conform to Institutional Review Board regulations. Some investigators have provided incentives on a sliding scale based on the number of completed monitoring days.