

Accelerometer Data Collection Training

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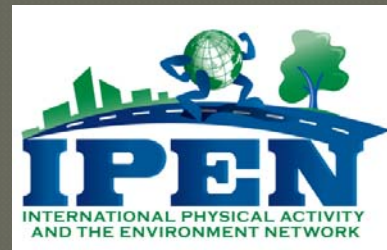
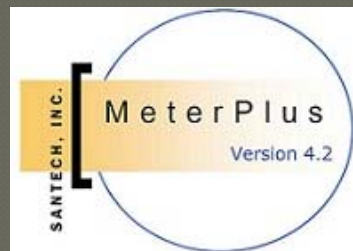
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Measurement Training

#1 of 3

TRAINING #1 (PRE DATA COLLECTION)

1. IPEN
2. IPAQ & A-NEWS
3. Accelerometry 101
4. About the ActiGraph
5. Preparing for ActiGraph data collection
6. Charging, Initializing, & Delivering
7. Compliance Tips and Prompting
8. Certification

Physical Activity Measurement

- When people self report physical activity, nation prevalence studies show that 30-60% of adults are active for 30 minutes 5 days a week
- Accelerometer data, which is a more objective measure, show that this is only 5%
- People over-estimate how active they are!

IPAQ & A-NEWS

- ◎ In-person survey administration (data collectors)
 - Provide clarifications, definitions as needed
 - Checking for over-reporting on IPAQ
 - Double-reporting or responding for entire week instead of one day
 - Coding responses correctly in NEWS
 - Probing when necessary– there are no “I don’t know” or “not applicable” options!
 - Checking for completeness during interview and again at the end
- ◎ Data screening in the office (supervisors)
 - Check for missing responses
 - Check that skip patterns were followed correctly
 - Check for over-reporting on IPAQ
 - Go back to participants to follow-up if possible

◎ A-NEWS (a few examples)

1. There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to. *[If no bicycle or pedestrian trails, choose “Strongly disagree”]*

Strongly disagree Somewhat disagree Somewhat agree Strongly agree

2. It is easy to walk to a transit stop, bus, train from my home. *[If they don't have these things in their neighborhood, choose “Strongly disagree”. If they have never walked there, ask them to imagine walking there and make their best judgment.]*

Strongly disagree Somewhat disagree Somewhat agree Strongly agree

About the Actigraph: GT1M & GT3X

- Can collect data in 1, 2, or 3 planes of movement (GT1M=1,2 planes & GT3X=3 planes)
- Minutes spent in different intensity categories
- Energy Expenditure
- Steps per day
- Water resistant (not waterproof!)
- Rechargeable battery via USB connection
- Fewer problems than with older models



- Increased memory that will last for months or years!
- USB connector for charging, initializing, and downloading
- Lithium ion battery lasts ~14 days (GT1M) and ~ 20 days (GT3X)
- Auto low power mode

Stages of Actigraph

1. Charge

Charge devices fully before distributing

2. Initialize

Initialize device to begin collecting data using the Actilife software

3. Download

Download device using Actilife and save file to computer

4. Screen

Screen data file for valid wearing time using the MeterPlus software

5. Enough time?

Decide if enough valid data has been collected

Logistics & Staffing

- ⊙ Linking Actigraph serial number to participant in the field
 - In field assign serial # to participant ID #
 - Make sure field records are entered into database
- ⊙ Tracking dates of delivery and pick-up
- ⊙ Assigning drop-off and pick-up visits
 - Pick up scheduled on 8th wearing day (9 days after delivery) IF participant didn't start late or miss any days.
- ⊙ At least a 50% FTE will be needed to manage the equipment initialization and downloading (includes prompt calling).
- ⊙ At least a 50% FTE is needed for data management (includes data screening, compliance decisions and data scoring).

- Meter Tracking
- Meter Inventory
- Contacts

Access Tracking Database

- Two functions: Track devices and track people
 - Meter (tracking & inventory) form to track dates, wearing time, history of devices
 - Queries to track return times, problem units, compliance rates, outstanding units
 - Used by person initializing and screening meter files
 - Participant (contacts) form to track visits, phone calls, etc.
 - Queries to track recruitment numbers and rates, demographics, history of participant in study
 - Used by person doing recruitment and/or managing and scheduling data collectors
- Tracking some things in 2 places is a good quality control practice

Initializing the Actigraph

ActiLife v4.4.1

Analyze Data Options Help

GT3X
Serial: MAT2C47090173
Firmware: 3.1.1

Refresh Report Status

Subject Information
Name: Not Initialized

Download Data **Battery** 4.16 V -- 100% **Initialize Device** actigraph.com

Report Status Information

Modes		Device Information
<input checked="" type="checkbox"/> Initialized	<input checked="" type="checkbox"/> Step Count	Master Timer: 0 sec
<input checked="" type="checkbox"/> Delay Mode		Address Pointer: 0
<input checked="" type="checkbox"/> Raw Data Mode	<input checked="" type="checkbox"/> Flash LED	Epoch Counter: 0
<input checked="" type="checkbox"/> Activity		Calibration Date: 12/2/2009
<input checked="" type="checkbox"/> Dual Axis	<input checked="" type="checkbox"/> Inclinometer	Reference Epoch: 60 sec
<input checked="" type="checkbox"/> 3rd Axis	<input checked="" type="checkbox"/> Low Frequency Extension	Mode Word: 0x4104

ActiGraph™

Click
to Initialize

Can collect other data types such as steps or 2nd axis

Initialize GT1M

Select Other Optional Modes

- Activity (Default Mode)
- Step Count
- Flash LED
- Dual Axis

Epoch Period

Epoch (in seconds): 60

Filter Option

Normal

Start Date & Time

4 / 2 / 2010 M/d/yyyy 12:00 AM

Stop Date & Time

Enable Stop Time

4 / 2 / 2010 M/d/yyyy 1:00 PM

Status Information

Device Detected: GT1M Memory Available: 1 MB Battery Voltage: 4.18 V

Maximum record time based on selected settings: 113d 18h 39m 0s

Subject Information

Name: 1014003003 Up to 16 characters

OK Cancel

60 seconds common epoch for adults

Always midnight, 1 day after drop-off day

Don't enable stop time

Check battery fully charged (4.18 V)

Enter ID number at this stage (if known)

Let's try it

Attaching the Belt & Wear position

- ◉ 3 different size belts (36in, 48in, 60in).
- ◉ Take off one half of the buckle, thread through device
- ◉ Worn on waist, over right hip, snug fit
- ◉ Over or under clothing

Let's try it



Delivery of Actigraph: Checklist

- Make link between device serial number and participant
- Show participant the graphs of compliant and noncompliant data patterns
- Offer to provide personalized graphs to participants when they are done
- Adjust belt to fit participant and show them how to wear it
- Make sure participant can start right away – no travel plans
- Give participant meter log and explain
- Give participant meter instructions and review
- Give participant your contact information
- Make sure all talking points are covered

Prompt Calls

- Calls made on Days 2 and 5

- Reminder to wear
- Check if on schedule
- Troubleshoot problems or delayed wearing
- Answer questions



- What to do if participant started late, hasn't started, can't find meter

Considerations:

- Battery life
- Re-visit schedule
- Likelihood of better outcome if do it again
- How believable the person is

- What to do if can't reach participant by visit or phone

- KEEP TRYING! Persistence usually pays off.
- Leave postage-paid envelopes for them to send meter back to you
- Stress to them that someone else is waiting to wear the meter
- Offer reward as LAST resort



Measurement Training #2 of 3

TRAINING #2 **(POST DATA COLLECTION)**

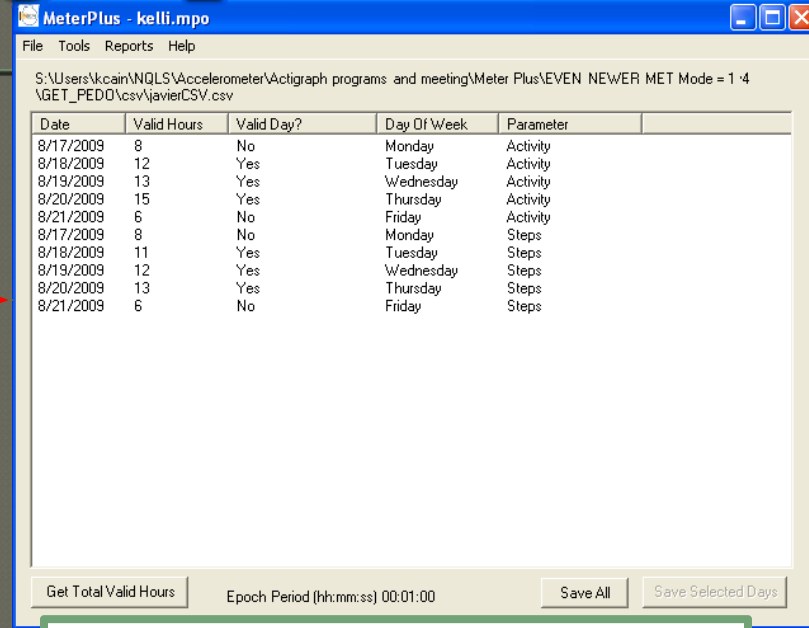
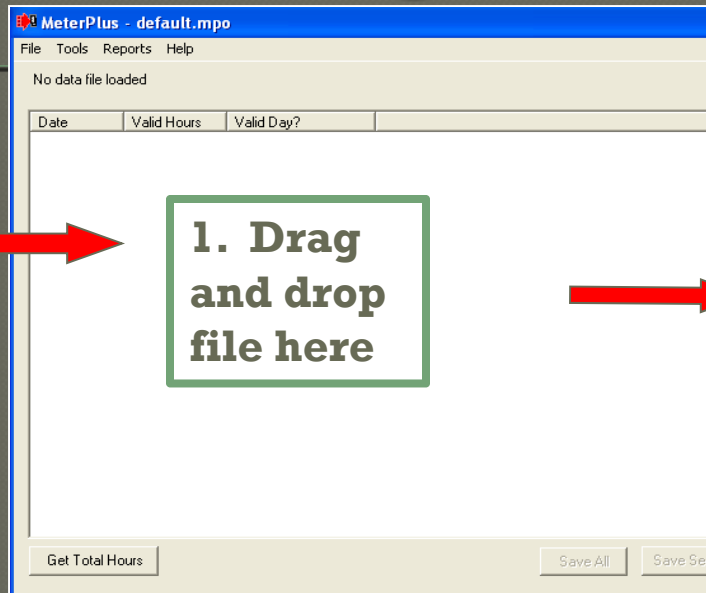
- 1.Receiving Actigraph data
- 2.Cleaning and Scoring
- 3.Certification

Screening Actigraph files

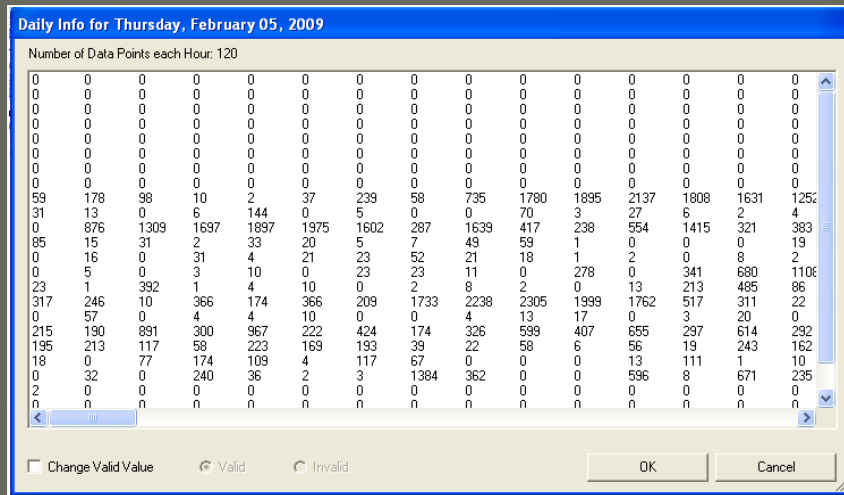
Raw data file



SN50163.dat



2. Data displayed in list



3. Click day open for detailed view of raw data

Top left cell is **ALWAYS**
MIDNIGHT

One column is **ALWAYS** 1 epoch (in this case 30s)

Daily Info for Thursday, February 05, 2009

Number of Data Points each Hour: 120

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	178	98	10	2	37	239	58	735	1780	1895	2137	1808	1631	1252	0
31	13	0	6	144	0	5	0	0	70	3	27	6	2	4	0
0	876	1309	1697	1897	1975	1602	287	1639	417	238	554	1415	321	383	0
0	15	31	2	33	20	5	7	49	59	1	0	0	0	19	0
0	16	0	31	4	21	23	52	21	18	1	2	0	8	2	0
0	5	0	3	10	0	23	23	11	0	278	0	341	680	1108	0
0	1	392	1	4	10	0	2	8	2	0	13	213	485	86	0
0	246	10	366	174	366	209	1733	2238	2305	1999	1762	517	311	22	0
0	57	0	4	4	10	0	0	4	13	17	0	3	20	0	0
0	215	190	891	300	967	222	424	174	326	599	407	655	297	614	292
0	195	213	117	58	223	169	193	39	22	58	6	56	19	243	162
0	18	0	77	174	109	4	117	67	0	0	13	111	1	10	0
0	0	32	0	240	36	2	3	1384	362	0	0	596	8	671	235
0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Change Valid Value Valid Invalid

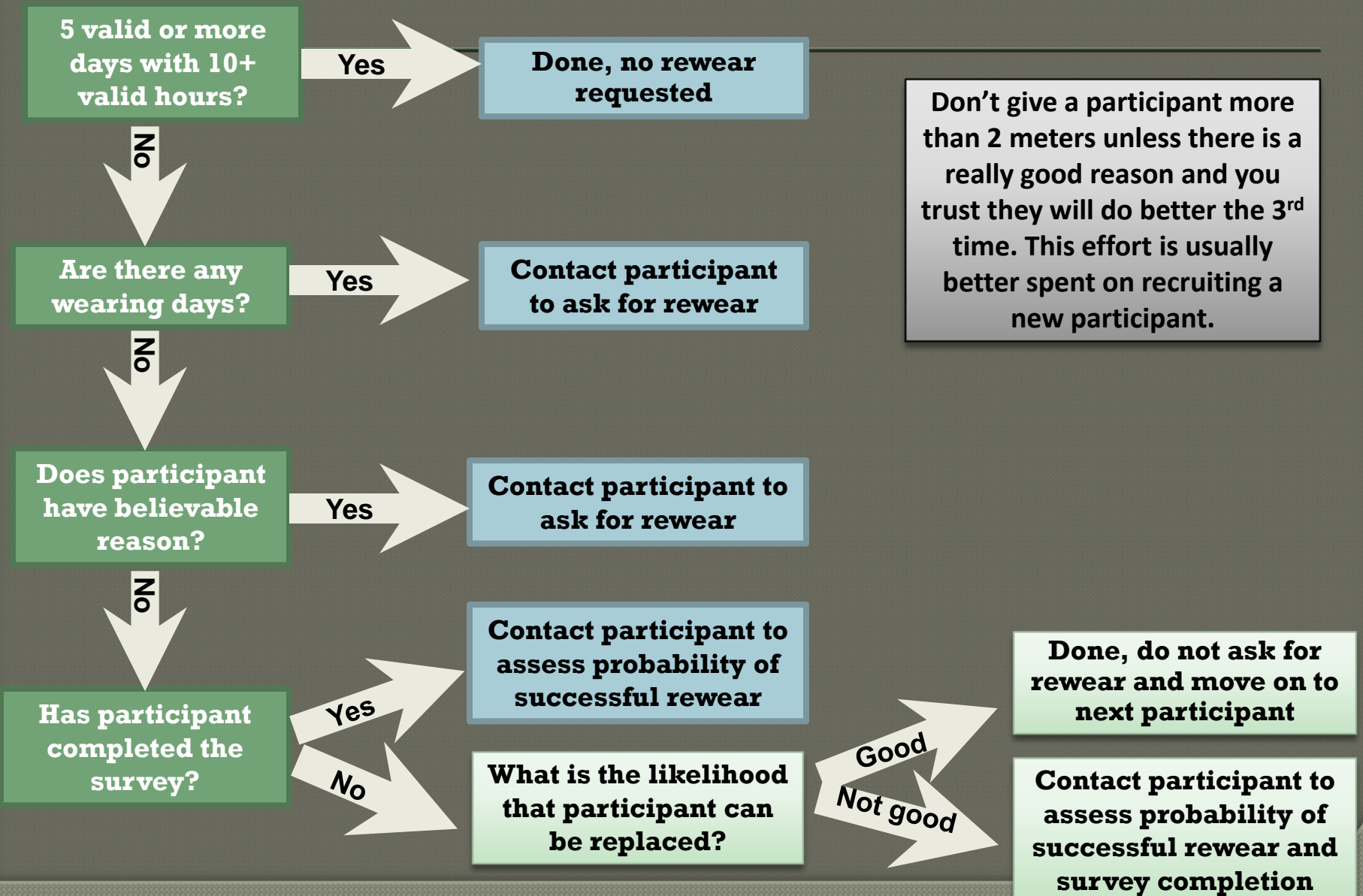
One line is **ALWAYS** 1 hr

8am

9pm

- 1 min epoch: 60 data points per hour (per case)
- 30s epoch: 120 data points/hr
- 15s epoch: 240 data points/hr
- 1s epochs: 3600 data points/hr

Step 2: Rewear Decision



Time filters (Tools/Options)

Select days of the week & times per day (e.g., after-school hours) to summarize activity.

Sum data within these time periods

Start Time: 09:00 AM
End Time: 05:00 PM

Apply to Days

All Days
 Weekdays Only
 Weekends Only
 Specific Date: 5/16/2009

Save

May. 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Today: 5/16/2009

MeterPlus Options

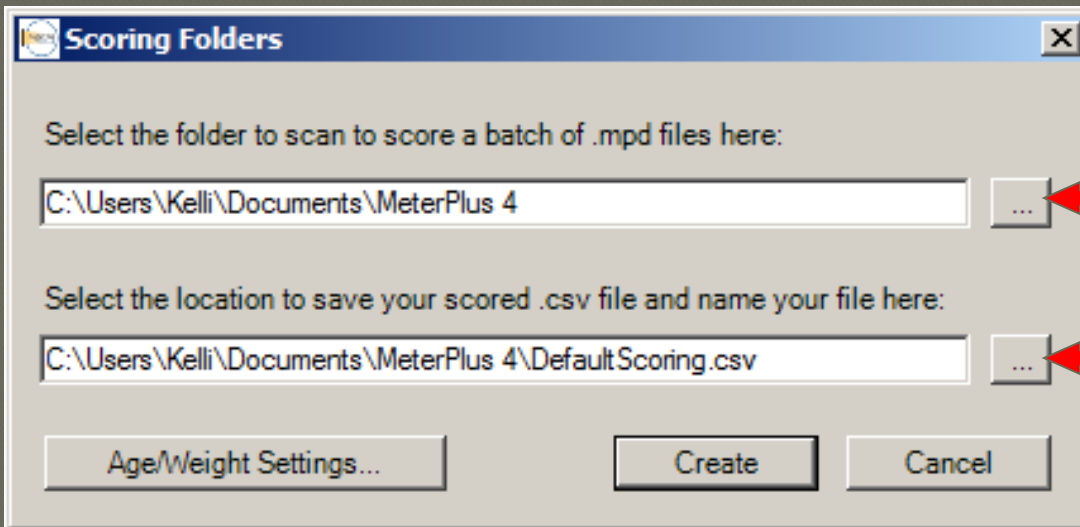
View Data | Score Data | Categories | Filename | Bouts | kCals | Filters

Create Time Filter Output File

Start Time	End Time	Apply to Days
08:00 AM	12:00 PM	Weekends Only
03:00 PM	07:00 PM	Weekdays Only

Add Filter | Edit | Delete

Step 4. Batch scoring (Reports/Scoring)



Scoring Folders

Select the folder to scan to score a batch of .mpd files here:

C:\Users\Kelli\Documents\MeterPlus 4

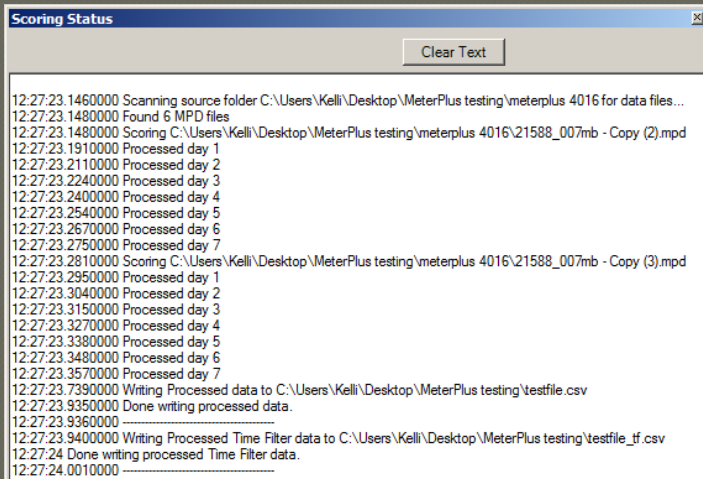
Select the location to save your scored .csv file and name your file here:

C:\Users\Kelli\Documents\MeterPlus 4\DefaultScoring.csv

Age/Weight Settings... Create Cancel

Where to find individual files to process

Where to save processed CSV file for entire sample



Scoring Status

Clear Text

```
12:27:23.1460000 Scanning source folder C:\Users\Kelli\Desktop\MeterPlus testing\meterplus 4016 for data files...
12:27:23.1480000 Found 6 MPD files
12:27:23.1480000 Scoring C:\Users\Kelli\Desktop\MeterPlus testing\meterplus 4016\21588_007mb - Copy (2).mpd
12:27:23.1910000 Processed day 1
12:27:23.2110000 Processed day 2
12:27:23.2240000 Processed day 3
12:27:23.2400000 Processed day 4
12:27:23.2540000 Processed day 5
12:27:23.2670000 Processed day 6
12:27:23.2750000 Processed day 7
12:27:23.2810000 Scoring C:\Users\Kelli\Desktop\MeterPlus testing\meterplus 4016\21588_007mb - Copy (3).mpd
12:27:23.2950000 Processed day 1
12:27:23.3040000 Processed day 2
12:27:23.3150000 Processed day 3
12:27:23.3270000 Processed day 4
12:27:23.3380000 Processed day 5
12:27:23.3480000 Processed day 6
12:27:23.3570000 Processed day 7
12:27:23.7390000 Writing Processed data to C:\Users\Kelli\Desktop\MeterPlus testing\testfile.csv
12:27:23.9350000 Done writing processed data.
12:27:23.9360000 -----
12:27:23.9400000 Writing Processed Time Filter data to C:\Users\Kelli\Desktop\MeterPlus testing\testfile_tf.csv
12:27:24.0010000 Done writing processed Time Filter data.
12:27:24.0010000 -----
```

One step → Create

Activity, Bouts, EE variables

Activity

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	SN	city	neighbo	walka	group	id	Filename	Date	TotDays	VldDays	VldHours	TotVdnot_wearin	TotVdsedent	TotVdligh	TotVdmod
2	50168	1	1	1	0	7310	101107310.DAT	11/12/2003	8	8	102	5434	3585	2404	93
3	51165	5	33	1	0	0210	533100210.dat	11/24/2005	8	8	97	5915	4510	1087	8
4	50293	6	15	4	0	0120	6154100120.dat	1/22/2008	7	7	89	4808	3438	1720	114
5															

Serial number, start date, # valid days & hours, number of epochs in each activity category across all valid days.

Bouts

	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ
1	D1_bout_num	D1_bout_lenqtl	D1_bout_avg	D1B1_st_time	D1B1_end_time	D1B2_st_time	D1B2_end_time	D1B3_st_time	D1B3_end_time	D1B4_st_time
2	1	14	14	11/12/2003 13:47	11/12/2003 14:01	NULL	NULL	NULL	NULL	NULL
3	1	10	10	11/24/2005 9:00	11/24/2005 9:10	NULL	NULL	NULL	NULL	NULL
4	4	119	29.75	1/22/2008 0:00	1/22/2008 0:17	1/22/2008 6:59	1/22/2008 8:07	1/22/2008 8:32	1/22/2008 8:55	1/22/2008 9:53
5										
6										

Number of bouts, total and average length of bouts, start and end times of each bout.

Energy Expenditure

	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	Tot_kcal	KCal_mean	KCal_peak	KCal_not_w	KCal_sedentary	KCal_light	KCal_moderate	KCal_hard	KCal_very_hard	D1Date	D1Day	D1vday	D1vh
2	1195.47	149.43	224.58	0	49.81	1145.66	0	0	0	11/12/2003	Wednesday	1	5
3	463.31	57.91	95.95	0	31.55	431.76	0	0	0	11/24/2005	Thursday	1	14
4	863.27	123.32	167.77	0	33.68	829.59	0	0	0	1/22/2008	Tuesday	1	6
5													

Total, mean & peak caloric expenditure, caloric expenditure in each activity category.



Measurement Training

#3 of 3

TRAINING #3

(MANAGEMENT AND TRAINING)

1. Hiring
2. Delivery & Compliance Training
3. Checking (Quality Control)
4. Electronic tracking
5. Certification
6. Data transfer

Data Collection Checking

- Recruitment database checked weekly for cases that have fallen between the cracks (next action not coded, dates are mistyped, person not being contacted anymore, etc.)
- Query of outstanding units prepared weekly and each is reviewed to be sure that appropriate action is being taken to retrieve
- Survey completeness checks completed for all surveys before data entry – particular attention paid to correct ID numbers
- Data entry staff also trained to spot missed items, incorrect skip logic, over-reporting on IPAQ
- Data entry done in duplicate or all entry check by supervisor until person is 'certified' ($< .0125$ error rate; $\# \text{ errors} / \# \text{ keystrokes in survey}$)

Electronic tracking

- ◎ Review of the Tracking Database
 - Different forms
 - Queries
 - Set-up for multiple users
 - Reports can be generated
 - Call lists
 - Visit schedules
 - Recruitment reports for IPEN-CC
- ◎ Training to use database

Certification

- Review certification results
- Re-train if necessary and try again
- Can give conditional certification, meaning you will check most of their work until it is acceptable
- For data collectors, role playing is most important piece – can they explain it well, remember all the key points, answer general questions.
- For data managers, technical proficiency, understanding of how to use tracking database and decision-making about valid wearing time are the most important.