

Figure S1: CONSORT 2010 Flow Diagram

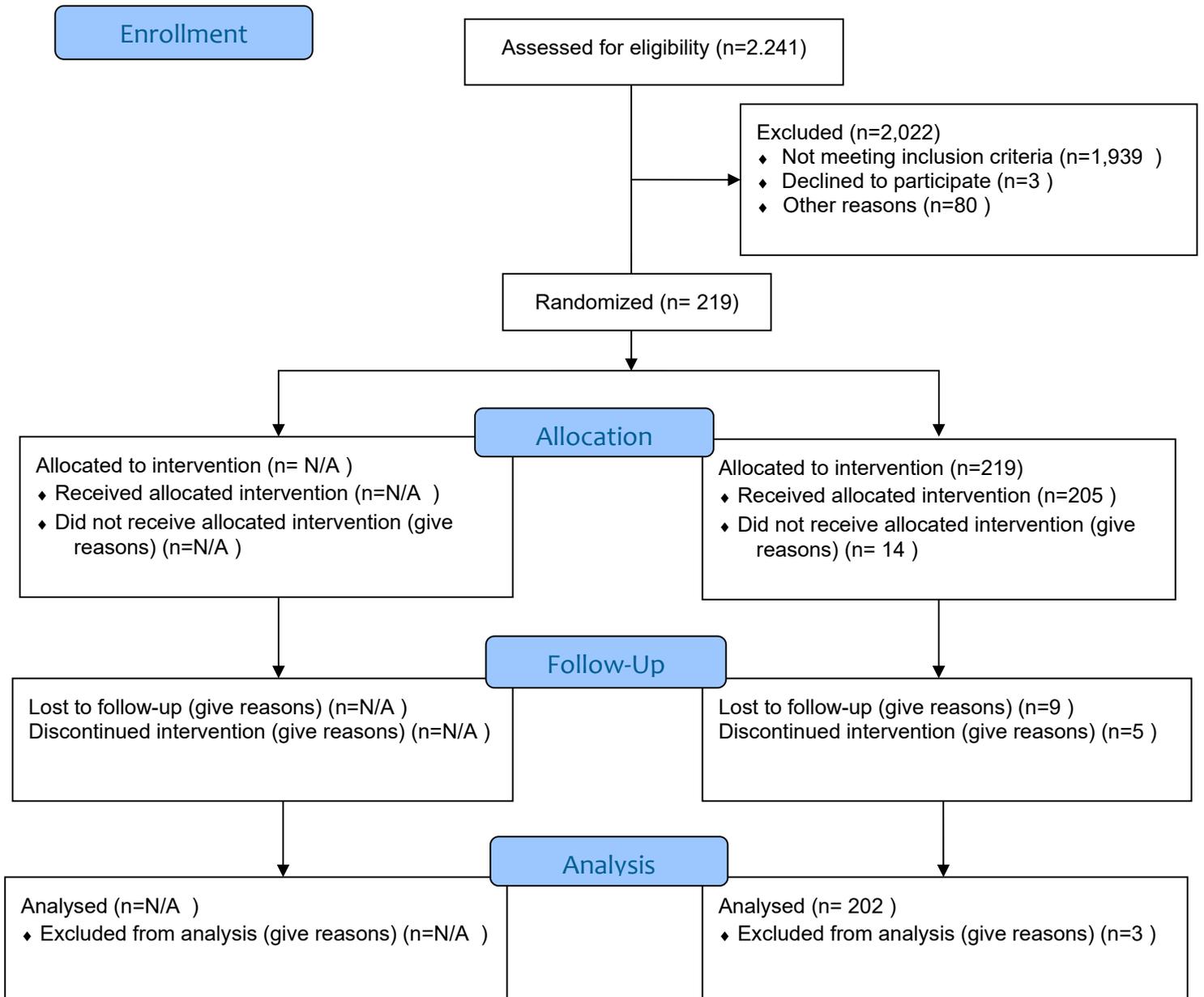


Table S1. Correlation (Pearson) between teens' and parents' responses – Teens age 11-13.

N = 88	Parent VAS	Parent APBQ	Parent Facial	Parent Verbal	Parent Behavioral
Teen VAS	0.61	0.09	0.10	0.10	0.05
BMIS	-0.47	-0.24	-0.14	-0.30	-0.18
STAI-C	0.48	0.21	0.07	0.28	0.18
PCS-C	0.19	0.07	-0.05	0.08	0.13
Rumination	0.22	0.07	0.0003	0.08	0.11
Magnification	0.15	0.02	-0.11	0.04	0.11
Helplessness	0.16	0.07	-0.04	0.08	0.13

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S2. Correlation (Spearman) between teens' and nurses' responses – Teens aged 11-13.

N = 88	Nurse VAS	Nurse APBQ	Nurse Facial	Nurse Verbal	Nurse Behavioral
Teen VAS	0.40	0.23	0.25	0.24	0.21
BMIS	-0.29	-0.19	-0.21	-0.21	-0.17
STAI-C	0.19	0.17	0.17	0.17	0.16
PCS-C	0.18	0.09	0.08	0.11	0.06
Rumination	0.18	0.06	0.09	0.09	0.03
Magnification	0.13	0.12	0.09	0.15	0.10
Helplessness	0.14	0.07	0.06	0.08	0.06

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S3. Correlation (Pearson) between teens' various scale responses – Teens age 11-13.

N = 88	BMIS	STAI-C	PCS-C	Rumination	Magnification	Helplessness
Teen VAS	-0.46	0.44	0.35	0.36	0.30	0.30
BMIS	---	-0.89	-0.38	-0.37	-0.31	-0.35
STAI-C	---	---	0.44	0.37	0.41	0.42
PCS-C	---	---	---	0.90	0.84	0.95
Rumination	---	---	---	---	0.66	0.77
Magnification	---	---	---	---	---	0.72

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S4. Correlation (Pearson) between teens' and parents' responses – Teens age 14-17.

N = 114	Parent VAS	Parent APBQ	Parent Facial	Parent Verbal	Parent Behavioral
Teen VAS	0.53	0.21	0.22	0.21	0.14
BMIS	-0.24	-0.23	-0.25	-0.18	-0.19
STAI-C	0.28	0.32	0.29	0.27	0.28
PCS-C	0.35	0.38	0.32	0.35	0.33
Rumination	0.28	0.35	0.28	0.33	0.31
Magnification*	0.24	0.28	0.25	0.27	0.24
Helplessness	0.35	0.34	0.30	0.30	0.31

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. *Spearman correlation coefficient, VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S5. Correlation (Spearman) between teens' and nurses' responses – Teens aged 14-17.

N = 114	Nurse VAS	Nurse APBQ	Nurse Facial	Nurse Verbal	Nurse Behavioral
Teen VAS	0.51	0.10	0.11	0.06	0.09
BMIS	-0.31	-0.28	-0.26	-0.21	-0.27
STAI-C	0.32	0.22	0.22	0.12	0.24
PCS-C	0.18	0.19	0.17	0.18	0.20
Rumination	0.27	0.16	0.12	0.16	0.16
Magnification	0.17	0.14	0.16	0.07	0.16
Helplessness	0.12	0.18	0.17	0.19	0.17

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S6. Correlation (Pearson) between teens' various scale responses – Teens age 14-17.

N = 114	BMIS	STAI-C	PCS-C	Rumination	Magnification*	Helplessness
Teen VAS	-0.28	0.39	0.36	0.36	0.23	0.33
BMIS	---	-0.80	-0.44	-0.37	-0.34	-0.42

STAI-C	---	---	0.47	0.37	0.39	0.43
PCS-C	---	---	---	0.87	0.77	0.95
Rumination	---	---	---	---	0.54	0.73
Magnification*	---	---	---	---	---	0.66

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. *Spearman correlation coefficient. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S7. Correlation (Pearson) between teens' and parents' responses – Girls.

N = 114	Parent VAS	Parent APBQ	Parent Facial	Parent Verbal	Parent Behavioral
Teen VAS	0.56	0.16	0.25	0.13	0.05
BMIS	-0.41	-0.24	-0.22	-0.26	-0.16
STAI-C	0.37	0.26	0.20	0.28	0.19
PCS-C	0.23	0.20	0.11	0.18	0.21
Rumination	0.24	0.20	0.11	0.18	0.22
Magnification	0.17	0.18	0.13	0.18	0.16
Helplessness	0.20	0.15	0.08	0.13	0.18

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S8. Correlation (Spearman) between teens' and nurses' responses – Girls.

N = 114	Nurse VAS	Nurse APBQ	Nurse Facial	Nurse Verbal	Nurse Behavioral
Teen VAS	0.45	0.09	0.09	0.06	0.07
BMIS	-0.25	-0.20	-0.20	-0.17	-0.19
STAI-C	0.18	0.10	0.11	0.06	0.10
PCS-C	0.04	0.09	0.08	0.07	0.08
Rumination	0.18	0.10	0.07	0.07	0.10
Magnification	0.01	0.04	0.06	0.02	0.02

Helplessness	0.004	0.09	0.09	0.08	0.07
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Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S9. Correlation (Pearson) between teens' various scale responses – Girls.

N = 114	BMIS	STAI-C*	PCS-C	Rumination	Magnification	Helplessness
Teen VAS	-0.39	0.35	0.24	0.30	0.09	0.21
BMIS	---	-0.85	-0.41	-0.40	-0.32	-0.35
STAI-C	---	---	0.40	0.35	0.38	0.34
PCS-C	---	---	---	0.86	0.77	0.94
Rumination	---	---	---	---	0.53	0.71
Magnification	---	---	---	---	---	0.62

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children. * Spearman correlation coefficient.

Table S10. Correlation (Pearson) between teens' and parents' responses – Boys.

N = 88	Parent VAS	Parent APBQ	Parent Facial	Parent Verbal	Parent Behavioral
Teen VAS	0.56	0.11	0.04	0.14	0.12
BMIS	-0.28	-0.25	-0.18	-0.25	-0.24
STAI-C	0.38	0.26	0.16	0.27	0.27
PCS-C	0.32	0.23	0.18	0.21	0.24
Rumination	0.25	0.19	0.16	0.17	0.18
Magnification*	0.22	0.16	0.10	0.15	0.19
Helplessness	0.35	0.26	0.22	0.22	0.27

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. *Spearman correlation coefficient. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S11. Correlation (Spearman) between teens' and nurses' responses – Boys.

N = 88	Nurse VAS	Nurse APBQ	Nurse Facial	Nurse Verbal	Nurse Behavioral
Teen VAS	0.52	0.28	0.30	0.25	0.25
BMIS	-0.35	-0.27	-0.30	-0.25	-0.24
STAI-C	0.36	0.30	0.32	0.22	0.30
PCS-C	0.36	0.23	0.21	0.23	0.20
Rumination	0.35	0.15	0.16	0.17	0.10
Magnification	0.34	0.27	0.24	0.22	0.27
Helplessness	0.30	0.23	0.20	0.24	0.21

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

Table S12. Correlation (Pearson) between teens' various scale responses – Boys.

N = 88	BMIS	STAI-C	PCS-C	Rumination	Magnification*	Helplessness
Teen VAS	-0.34	0.49	0.46	0.39	0.39	0.44
BMIS	---	-0.85	-0.43	-0.35	-0.29	-0.44

STAI-C	---	---	0.50	0.37	0.35	0.52
PCS-C	---	---	---	0.90	0.85	0.96
Rumination	---	---	---	---	0.66	0.79
Magnification*	---	---	---	---	---	0.75

Note: Correlation coefficients listed in bold are significant at the 0.05 level. N is the number of patients. *Spearman correlation coefficient. VAS is the Visual Analog Scale; BMIS is the Brief Mood Introspection Scale; STAI-C –is the State-Trait Anxiety Inventory for Children; PCS-C is the Pain Catastrophizing Scale for Children.

The questionnaires and the score documents used: Visual Analog Scale from the teenager (tVAS), Visual Analog Scale from the parent (pVAS), Visual Analog Scale from the nurse (nVAS), Adolescent Pain Behavior Questionnaire from the parent (pAPBQ), Adolescent Pain Behavior Questionnaire from the nurse (nAPBQ), State-Trait Anxiety Inventory for the children (STAIC S – Anxiety), Pain Catastrophizing Scale for the children (PCS-C), and Brief Mood Introspection Scale (BMIS).

Pain Questionnaire - Patient

How severe is your pain now?

Place a vertical mark on the line below to show how much pain you are feeling right now.

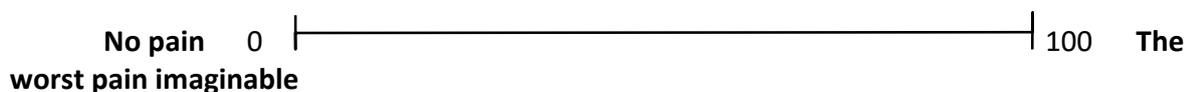


Fig 1 100 mm Visual Analog Scales
SCORE:

TOTAL

Pain Questionnaire - Parent

How severe do you think your child's pain is right now?

Place a vertical mark on the line below to indicate how much pain your child is feeling right now.

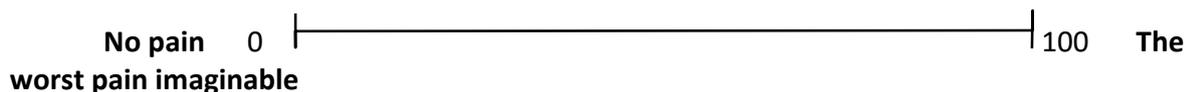


Fig 1 100 mm Visual Analog Scales

SCORE:

TOTAL

Pain Questionnaire - Nurse

How severe do you think your patient's pain is right now?

Place a vertical mark on the line below to indicate how much pain your patient is feeling right now.

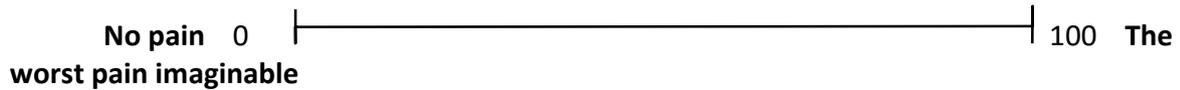


Fig 1 100 mm Visual Analog Scales

TOTAL SCORE:

Subject #: _____

Date: _____

Time: ____:____

Adolescent Pain Behaviors Questionnaire- Parent

Below is a list of common ways that children and teenagers use their faces to express when they are in pain. Please rate each behavior from 0 (Never) to 5 (Almost Always) to show how often you notice your child making these facial responses when he/she is experiencing pain.

	0 Never	1 Almost times	2 Some Often	3 Fairly ften	4 Almost Always	5 Almost Always
Face changes color (red, pale)	0	1	2	3	4	5
Dazed/eyes glazed	0	1	2	3	4	5
Clenched jaw	0	1	2	3	4	5
Frowning	0	1	2	3	4	5
Circles under eyes	0	1	2	3	4	5
Wincing/grimacing	0	1	2	3	4	5

TOTAL SCORE:

This questionnaire was adapted from the Adolescent Pain Behavior Questionnaire described in the 2010 article from the PAIN journal Vol. 151, 834-842, "Parent perceptions of adolescent pain expression: The adolescent pain behavior questionnaire," by A.M. Lynch-Jordan, S. Kashikar-Zuck, and K.R. Goldschneider.

Subject #: _____

Date: _____

Time: ____:____

Adolescent Pain Behaviors Questionnaire- Nurse

Below is a list of common ways that children and teenagers use their faces to express when they are in pain. Please rate each behavior from 0 (Never) to 5 (Almost Always) to show how often you notice your patient making these facial responses when he/she is experiencing pain.

	N ever	Never	Almost times	Some Often	Fairly ften	(Always	Almost
Face changes color (red, pale)	0	1	2	3	4	5	

Dazed/eyes glazed	0	1	2	3	4	5
Clenched jaw	0	1	2	3	4	5
Frowning	0	1	2	3	4	5
Circles under eyes	0	1	2	3	4	5
Wincing/grimacing	0	1	2	3	4	5
Tears in eyes	0	1	2	3	4	5

Below is a list of common things that children and teenagers may say or do when they are in pain. Please rate each behavior from 0 (Never) to 5 (Almost Always) to show how often you notice your patient making these sounds or asking these questions when he/she is experiencing pain.

	0 Never	1 Almost mes	2 Someti Often	3 Fairly en	4 Oft Always	5 Almost
Whines	0	1	2	3	4	5
Complains/talks about hurting	0	1	2	3	4	5
0. Cries	0	1	2	3	4	5
1. Sighs	0	1	2	3	4	5
2. Groans	0	1	2	3	4	5
3. Asks Mom or Dad for help	0	1	2	3	4	5
4. Whimpers	0	1	2	3	4	5
5. Yells or screams when in pain	0	1	2	3	4	5
6. Gets irritable/moody	0	1	2	3	4	5
7. Gets quiet	0	1	2	3	4	5

Subject #: _____

Below is a list of things that children and teenagers may do when they are in pain. Please rate the behaviors from 0 (Never) to 5 (Almost Always) to show how often you notice your patient making these actions and gestures when he/she is experiencing pain.

	0 Never	1 Almost times	2 Some Often	3 Fairly ften	4 Almost Always	5 Almost
18. Fidgeting or restless	0	1	2	3	4	5
19. Tense body	0	1	2	3	4	5
20. Hunched over or stooping	0	1	2	3	4	5
21. Holding area of body that hurts	0	1	2	3	4	5

22.	Moves slowly or protectively	C	1	2	3	4	5
23.	Walks with a limp	C	1	2	3	4	5
24.	Rubbing area of body that hurts	C	1	2	3	4	5
25.	Avoids touching/bumping area of body that hurts	C	1	2	3	4	5
26.	Flinches or jerks when painful area is touched	C	1	2	3	4	5

Other comments regarding your patient's behavior:

TOTAL SCORE:

This questionnaire was adapted from the Adolescent Pain Behavior Questionnaire described in the 2010 article from the PAIN journal Vol. 151, 834-842, "Parent perceptions of adolescent pain expression: The adolescent pain behavior questionnaire," by A.M. Lynch-Jordan, S. Kashikar-Zuck, and K.R. Goldschneider.

HOW-I-FEEL QUESTIONNAIRE sample

Developed by C.D. Spielberger, C.D. Edwards, J. Montuori, and R. Lushene

STAIC Form C-1:

SUBJECT # _____ Date: _____ Time: _____

DIRECTIONS: A number of statements which boys and girls use to describe themselves are given below. Read each statement carefully and decide how you feel *right now*. Then put an X in the box in front of the word or phrase which best describes how you feel. There are no right or wrong answers. Don't spend too much time on any one statement. Remember, find the word or phrase which best describes how you feel right now, *at this very moment*.

1. I feel very calm calm not calm
2. I feel very upset upset not upset
3. I feel very pleasant pleasant not pleasant
4. I feel very nervous nervous not nervous
5. I feel very jittery jittery not jittery
6. I feel very rested rested not rested
7. I feel very scared scared not scared
8. I feel very relaxed relaxed not relaxed
9. I feel very worried worried not worried
10. I feel very satisfied satisfied not satisfied
11. I feel very frightened frightened not frightened
12. I feel very happy happy not happy
13. I feel very sure sure not sure
14. I feel very good good not good
15. I feel very troubled troubled not troubled
16. I feel very bothered bothered not bothered
17. I feel very nice nice not nice
18. I feel very terrified terrified not terrified
19. I feel very mixed-up mixed-up not mixed-up
20. I feel very cheerful cheerful not cheerful

Scoring Key for STAI for Children Sample

Scoring Instructions for STAIC Form C-1

Fold this paper in half and line up next to the appropriate item numbers on the answer sheet. Be sure you are on the correct side of the answer sheet (Form C-1). Total the scoring weights shown for the marked responses.

1. 1 2 3
2. 3 2 1
3. 1 2 3
4. 3 2 1
5. 3 2 1
6. 1 2 3
7. 3 2 1
8. 1 2 3
9. 3 2 1
10. 1 2 3

- 11. 3 2 1
- 12. 1 2 3
- 13. 1 2 3
- 14. 1 2 3
- 15. 3 2 1
- 16. 3 2 1
- 17. 1 2 3
- 18. 3 2 1
- 19. 3 2 1
- 20. 1 2 3

Total Score for C-1 _____

Subject #: _____
 Date: _____
 Time: ____ : ____

Thoughts and Feelings During Pain (PCS-C)

We are interested in what you think and how strong the feelings are when you are in pain. Below are 13 different thoughts and feelings you may have when you are in pain. On a scale from 0 (Not at all) to 4 (Extremely), try to show us as clearly as possible what you think and feel by putting a circle around the word that best reflects how strongly you have each thought, after each sentence.

		Not at all	Mildly	Moderately	Severely	Extremely
1.	When I am in pain, I worry all the time about whether the pain will end.	0	1	2	3	4
2.	When I am in pain, I feel I can't go on like this much longer.	0	1	2	3	4
3.	When I am in pain, it's terrible and I think it's never going to get better.	0	1	2	3	4
4.	When I am in pain, it's awful and I feel that it takes over me.	0	1	2	3	4
5.	When I am in pain, I can't stand it anymore.	0	1	2	3	4
6.	When I am in pain, I become afraid that the pain will get worse.	0	1	2	3	4
7.	When I am in pain, I keep thinking of other painful events.	0	1	2	3	4
8.	When I am in pain, I want the pain to go away.	0	1	2	3	4
9.	When I am in pain, I can't keep it out of my mind.	0	1	2	3	4
10.	When I am in pain, I keep thinking about how much it hurts.	0	1	2	3	4
11.	When I am in pain, I keep thinking about how much I want the pain to stop.	0	1	2	3	4
12.	When I am in pain, there is nothing I can do to stop the pain.	0	1	2	3	4
13.	When I am in pain, I wonder whether something serious may happen.	0	1	2	3	4

TOTAL SCORE:

This questionnaire was adapted from the pain catastrophizing scale for children (PCS-C) described in the 2003 publication in the PAIN journal, Vol. 104, 639-646, "The child version of the pain catastrophizing scale (PCS-C): a preliminary validation," by G. Crombez, P. Bijttebier, C. Eccleston, T. Mascagni, G. Mertens, L. Goubert, K. Verstraeten.

Scoring Key for STAI for Children Sample

Scoring Instructions for STAIC Form C-1

Fold this paper in half and line up next to the appropriate item numbers on the answer sheet. Be sure you are on the correct side of the answer sheet (Form C-1). Total the scoring weights shown for the marked responses.

- 1. 1 2 3
- 2. 3 2 1
- 3. 1 2 3
- 4. 3 2 1
- 5. 3 2 1
- 6. 1 2 3
- 7. 3 2 1
- 8. 1 2 3
- 9. 3 2 1
- 10. 1 2 3
- 11. 3 2 1
- 12. 1 2 3
- 13. 1 2 3
- 14. 1 2 3
- 15. 3 2 1
- 16. 3 2 1
- 17. 1 2 3
- 18. 3 2 1
- 19. 3 2 1
- 20. 1 2 3

Total Score for C-1 _____

Subject #: _____

Date: _____

Time: ____:____

Brief Mood Introspection Scale

INSTRUCTIONS: Circle the response on the scale below that indicates how well each adjective or phrase describes your present mood.

		Definitely Do Not Feel	Do Not Feel	Slightly Feel	Definitely Feel
1.	Lively	XX	X	V	V.V.
2.	Happy	XX	X	V	V.V.
3.	Sad	XX	X	V	V.V.
4.	Tired	XX	X	V	V.V.
5.	Caring	XX	X	V	V.V.
6.	Content	XX	X	V	VV
7.	Gloomy	XX	X	V	V.V.
8.	Jittery	XX	X	V	V.V.
9.	Drowsy	XX	X	V	V.V.
10.	Grouchy	XX	X	V	VV
11.	Peppy	XX	X	V	V.V.
12.	Nervous	XX	X	V	V.V.
13.	Calm	XX	X	V	V.V.
14.	Loving	XX	X	V	V.V.
15.	Fed up	XX	X	V	V.V.
16.	Active	XX	X	V	VV

TOTAL

SCORE:

This questionnaire was adapted from the Brief Introspection Scale (BMIS) published in the Journal of Personality and Social Psychology 1988, Vol. 55, No1, 102-111, "The Experience and Meta-Experience of Mood," by J.D. Mayer and Y.N. Geschke.

BMIS Scoring- Subtracting

1. Convert the Meddis response scale (XX, X, V, V.V.) to numbers:

XX = 1

X = 2

V = 3

VV = 4

Pleasant-Unpleasant Scale

- Effective range: 24 to -24

Add:

- Active

- Calm
- Caring
- Content
- Happy
- Lively
- Loving
- Peppy

Subtract:

- Drowsy
- fed up
- gloomy
- grouchy
- jittery
- nervous
- sad
- tired