

Development of ASRAP Questionnaire

Linguistic evaluation of provisional ASRAP items

This document outlines a formal assessment of the preliminary ASRAP questionnaire prior to formal cognitive de-briefing. When developing the instrument, each item was worded to minimize ambiguity, cognitive difficulty and to ensure each item meets accepted criteria for optimal translatability into non-English languages (e.g. avoidance of culturally-based idioms such as “feeling blue” or “sleeping soundly” that may not make sense in other languages and require adjustment to achieve cultural and linguistic equivalence.

This document outlines formal linguistic testing of each item to ensure they are concise, simply worded to avoid exceeding expected eighth grade (age of 14 years or less) reading level.

Each item has been assessed using the validated “simple measure of gobbledygook” SMOG calculator aiming for a SMOG index of <14.0 for each item. Any items scoring higher than 14 have been highlighted in bold, re-worded at the bottom of the table to improve readability and the SMOG index re-calculated to ensure readability has improved to within target range. In all cases, the revised wording of the item has been adopted for the provisional ASRAP questionnaire that shall be proceed to cognitive de-briefing within the target patient population.

Item #	SMOG analysis
1. Raynaud’s symptoms have caused pain in my fingers	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
2. Raynaud’s symptoms have caused numbness in my fingers	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
3. Raynaud’s symptoms has caused tingling in my fingers	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
4. Raynaud’s symptoms have made my fingers tender / hypersensitive to touch	The SMOG index: 13.8 Total words: 11 Total number of polysyllabic words: 1 Total number of sentences: 1
5. Raynaud’s symptoms have caused a burning sensation in my fingers	The SMOG index: 13.8 Total words: 10 Total number of polysyllabic words: 1 Total number of sentences: 1
6. Raynaud’s symptoms have made my fingers feel cold	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
7. Raynaud’s symptoms have made my fingers change one or more colours (white/blue/red/purple etc.)	The SMOG index: 8.1 Total words: 19 Total number of polysyllabic words: 0 Total number of sentences: 1
8. Raynaud’s symptoms have interfered with my ability to use my fingers	The SMOG index: 16.2 Total words: 11

	Total number of polysyllabic words: 2 Total number of sentences: 1
9. How frequently have you been experiencing attacks of Raynaud's symptoms?	The SMOG index: 16.2 Total words: 10 Total number of polysyllabic words: 2 Total number of sentences: 1
10. On average, how much total time have you spent each day experiencing attacks of Raynaud's symptoms	The SMOG index: 13.8 Total words: 16 Total number of polysyllabic words: 1 Total number of sentences: 1
11. On average, how long has a typical attack of Raynaud's lasted.	The SMOG index: 13.8 Total words: 11 Total number of polysyllabic words: 1 Total number of sentences: 1
12. Raynaud's symptoms have made me upset/tearful	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
13. Raynaud's symptoms have made me worry about my ability to do things	The SMOG index: 13.8 Total words: 12 Total number of polysyllabic words: 1 Total number of sentences: 1
14. Raynaud's symptoms have made me annoyed/frustrated	The SMOG index: 13.8 Total words: 8 Total number of polysyllabic words: 1 Total number of sentences: 1
15. Raynaud's symptoms have made me irritable	The SMOG index: 13.8 Total words: 6 Total number of polysyllabic words: 1 Total number of sentences: 1
16. Raynaud's symptoms have caused feelings of despair / loss of hope	The SMOG index: 8.1 Total words: 11 Total number of polysyllabic words: 0 Total number of sentences: 1
17. Raynaud's symptoms have made me embarrassed	The SMOG index: 13.8 Total words: 6 Total number of polysyllabic words: 1 Total number of sentences: 1
18. Raynaud's symptoms have caused low mood/made me depressed	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
19. Raynaud's symptoms have bothered me due to inability to do my usual things	The SMOG index: 16.2 Total words: 13 Total number of polysyllabic words: 2 Total number of sentences: 1
20. Raynaud's symptoms have beaten me/got the better of me	The SMOG index: 8.1 Total words: 9 Total number of polysyllabic words: 0 Total number of sentences: 1
21. Raynaud's symptoms have interfered with my ability to go shopping	The SMOG index: 16.2 Total words: 10 Total number of polysyllabic words: 2 Total number of sentences: 1

22. Raynaud's symptoms have interfered with my ability to do housework/ gardening	The SMOG index: 19.6 Total words: 11 Total number of polysyllabic words: 4 Total number of sentences: 1
23. Raynaud's symptoms have interfered with my ability to socialise	The SMOG index: 18 Total words: 9 Total number of polysyllabic words: 3 Total number of sentences: 1
24. Raynaud's symptoms have interfered with my ability to do my job (paid or unpaid)	The SMOG index: 16.2 Total words: 14 Total number of polysyllabic words: 2 Total number of sentences: 1
25. Raynaud's symptoms have interfered with my home/family life	The SMOG index: 16.2 Total words: 8 Total number of polysyllabic words: 2 Total number of sentences: 1
26. Raynaud's symptoms have interfered with personal relationships...	The SMOG index: 18 Total words: 7 Total number of polysyllabic words: 3 Total number of sentences: 1
27. I have been able to reduce (control) the intensity my Raynaud's symptoms	The SMOG index: 13.8 Total words: 12 Total number of polysyllabic words: 1 Total number of sentences: 1
28. Visiting a grocery store /supermarket has caused Raynaud's symptoms	The SMOG index: 18 Total words: 9 Total number of polysyllabic words: 3 Total number of sentences: 1
29. Household activities e.g. taking things out of the refrigerator/washing vegetables has triggered Raynaud's symptoms.....	The SMOG index: 13.8 Total words: 16 Total number of polysyllabic words: 4 Total number of sentences: 4
30. Being in air-conditioned rooms has triggered Raynaud's symptoms	The SMOG index: 13.8 Total words: 9 Total number of polysyllabic words: 1 Total number of sentences: 1
31. Being outdoors without gloves has triggered Raynaud's symptoms	The SMOG index: 8.1 Total words: 8 Total number of polysyllabic words: 0 Total number of sentences: 1
32. Stressful situations have triggered Raynaud's symptoms	The SMOG index: 13.8 Total words: 6 Total number of polysyllabic words: 1 Total number of sentences: 1
33. I have used gloves / extra clothing to control Raynaud's symptoms	The SMOG index: 8.1 Total words: 12 Total number of polysyllabic words: 0 Total number of sentences: 2
34. I have used hand warmers/put my hands in warm water to control/ manage Raynaud's symptoms	The SMOG index: 12.2 Total words: 16 Total number of polysyllabic words: 1 Total number of sentences: 2

35. I have limited my activities (going outside/doing things I enjoy) to avoid worsening Raynaud's symptoms	The SMOG index: 19.6 Total words: 15 Total number of polysyllabic words: 4 Total number of sentences: 1
36. Raynaud's symptoms have made me have to do things differently.....	The SMOG index: 12.2 Total words: 11 Total number of polysyllabic words: 1 Total number of sentences: 2
37. Raynaud's symptoms have made me need to seek help from others.....	The SMOG index: 8.1 Total words: 12 Total number of polysyllabic words: 0 Total number of sentences: 2
38. Raynaud's symptoms have caused me to worry about my future health....	The SMOG index: 8.1 Total words: 12 Total number of polysyllabic words: 0 Total number of sentences: 2
39. Changes to my normal routine have caused me to worry about possible worsening of Raynaud's symptoms.....	The SMOG index: 13.8 Total words: 17 Total number of polysyllabic words: 2 Total number of sentences: 2
Altered item wording and repeat SMOG assessment	
Altered item wording	New SMOG assessment
8. Raynaud's symptoms have made it difficult to use my fingers	The SMOG index: 13.8 Total words: 10 Total number of polysyllabic words: 1 Total number of sentences: 1
9. How often have you experienced attacks of Raynaud's symptoms?	The SMOG index: 8.1 Total words: 10 Total number of polysyllabic words: 0 Total number of sentences: 1
19. Being unable to do normal things because of Raynaud's symptoms has bothered me	The SMOG index: 13.8 Total words: 13 Total number of polysyllabic words: 1 Total number of sentences: 1
21. Raynaud's symptoms have made it difficult when I have been shopping	The SMOG index: 13.8 Total words: 11 Total number of polysyllabic words: 1 Total number of sentences: 1
22. Raynaud's symptoms have made it difficult to do work around the house	The SMOG index: 13.8 Total words: 12 Total number of polysyllabic words: 1 Total number of sentences: 1
23. Raynaud's symptoms have made social events / doing sport difficult	The SMOG index: 13.8 Total words: 10 Total number of polysyllabic words: 1 Total number of sentences: 1
24. Raynaud's symptoms have made it difficult to do my job (paid or unpaid)	The SMOG index: 13.8 Total words: 13 Total number of polysyllabic words: 1 Total number of sentences: 1

25. Raynaud's symptoms have had an effect on my home / family life	The SMOG index: 13.8 Total words: 12 Total number of polysyllabic words: 1 Total number of sentences: 1
26. Raynaud's symptoms have had an effect on my personal / private life	The SMOG index: 13.8 Total words: 12 Total number of polysyllabic words: 1 Total number of sentences: 1
28. Going inside a grocery store / super-market has caused Raynaud's symptoms	The SMOG index: 13.8 Total words: 12 Total number of polysyllabic words: 1 Total number of sentences: 1
35. I have avoided doing things (e.g. going outside / doing things I enjoy) to avoid making my Raynaud's symptoms worse	The SMOG index: 11.4 Total words: 21 Total number of polysyllabic words: 1 Total number of sentences: 3

Summary

In total, subtle changes were made to 11 items to improve comprehensibility and readability. This was felt to improve readability without affecting the concept being questioned. For all changed items, the repeat SMOG assessment resulted in a SMOG index of <14.0.