

**Making the EORTC QLQ-C30
interactive:
development of computerized
adaptive testing (CAT) for
EORTC QLQ-C30 dimensions**

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CAT

- Ask a question
- Use the response to this question to estimate the 'level'
- Select next question based on this knowledge
- Use the response to this question and the previous one to re-estimate the 'level' - and so on...
- Stop when the desired level of precision is reached

Advantages of CAT

- Individually adapted questionnaires – with fully comparable scores across individuals
- Increased precision (smaller samples required)
- Reduced response burden (and no 'stupid questions')
- Reduced floor and ceiling effects
- Questionnaire length selected for each study or person
- Immediate calculation of scores

QLG experience with CAT

- Previous project investigated the possibilities of CAT *within* QLQ-C30 (focus on PF, EF, and FA)
- Conclusions from project:
 - CAT could be programmed
 - Equivalent precision was obtained with about half the number of items

Proposed strategy for CAT

- Important to maintain multidimensionality of the questionnaire
- Develop CAT based on 5-20 items for each of the 15 QLQ-C30 dimensions
- Long-term strategy: each item bank could be extended if higher precision is desired (e.g. >100 items per bank, huge work)

Procedure for CAT development

- Phase 1: Literature review and interviews
 - Several groups working with one or more dimensions. Requires involvement of many interested QLG members
- Phase 2: Develop, select and pilot test new candidate items
 - Requires people with interest and experience in developing items. Could be the same as in phase 1

Procedure for CAT development

- Phase 3: Data collection (paper or computer administered) and analyses
 - Total $N > 1000$, data from at least three countries, requires centres capable of fast data collection
 - Analyses: remove poor items, estimate IRT model, develop CAT program, pilot testing CAT
- Phase 4: Test CAT in large samples
 - Implement CAT technology
 - Collect data from at least 3 'test centres', could be the same as in phase 3

Module vs. CAT

Phase	Module	CAT
1	Which issues to make items from	Which additional issues within the dimension to make items on
2	Make and pilot test items	Make and pilot test items
3 + 4	Data: known groups, longitudinal Scaling analyses	Data: representative, cross-sectional, large IRT analyses

Time frame/costs

- Work similar to developing several modules, could be very time-consuming
- QLG has funded next two years
- No funding of working groups' work: literature reviews, item development

First 1/2 year

Phase 1: Literature review and interviews

Phase 2: Develop, select and pilot test new candidate items

Concurrent statistical analyses (how are the item we have – and what are we missing?)

Second $\frac{1}{2}$ year

- Phase 3: Data collection (paper or computer administered) and analyses
 - Total $N > 1000$, data from at least three countries, requires centres capable of fast data collection

Concurrent reporting on phase 1-2

Year 2

- Statistical analyses
 - remove poor items,
 - estimate IRT models,
- Develop CAT software
- Pilot test CAT
- Complete EORTC QLQ-CAT (some dimensions as CAT – others as QLQ-C30)

Later

- Phase 4: Test CAT in large samples
 - Implement CAT technology
 - Collect data from at least 3 ‘test centres’
- Develop CAT for the QLQ-C30 dimensions not covered in the first wave
- Expand and improve CAT item pools