# PROPHECY: Patient Reported Outcomes in Prostate Cancer, a mobile-Health Experience in radiotherapY

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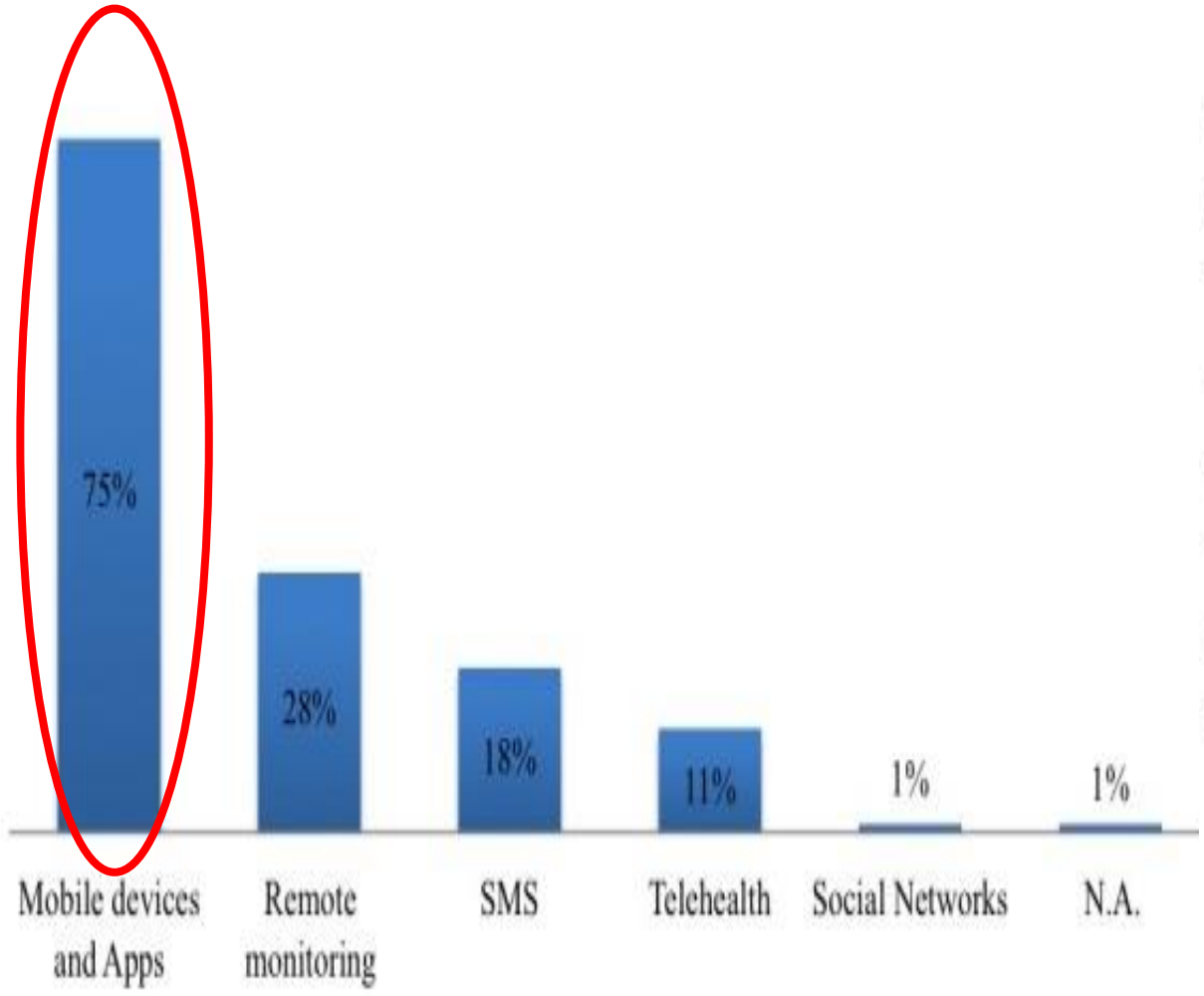
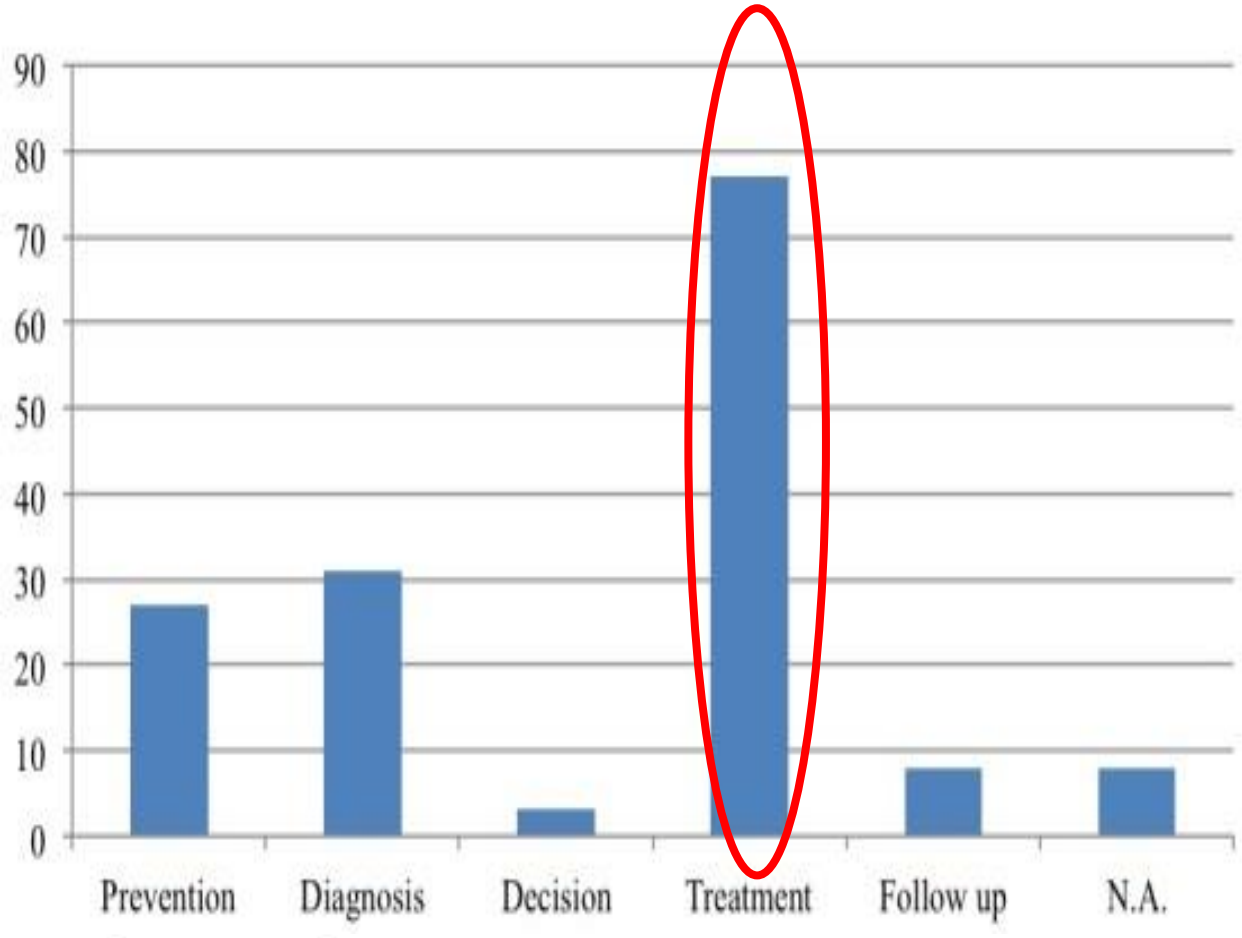
# Definition of PRO: Patient Reported Outcome

- Definition of PRO concept: "any report of the status of a patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else"
- PRO includes symptoms not obvious to the observer, frequency, severity, impact of daily activities and emotional burden
- PROs tend to give a view of the Health-Related Quality of Life (HRQL)
- QoL is seen as providing an overall assessment of the effect of both illness and its treatment on the patient


Patient-reported outcomes: A new era in clinical research. Deshpande PR, Rajan S, Sudeepthi BL et al. Perspect Clin Res. 2011 Oct;2(4):137-44

# Role of mobile-Health (mHealth)

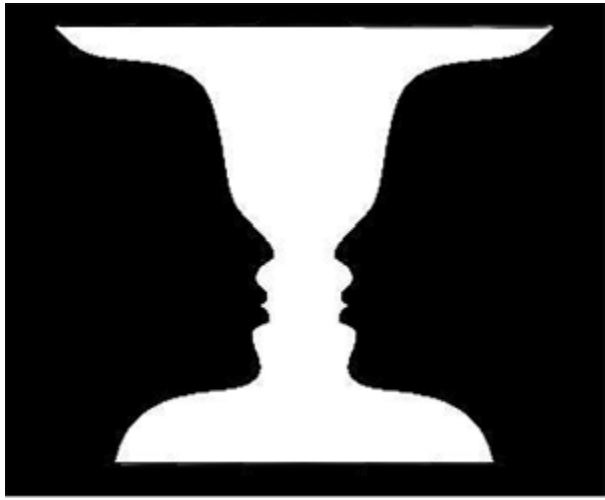



Nasi G, Cucciniello M, Guerazzi C. The role of mobile technologies in health care processes: the case of cancer supportive care. J Med Internet Res. 2015 Feb 12;17(2):e26
GREEN PAPER on mobile Health ("mHealth"); EUROPEAN COMMISSION; 2014

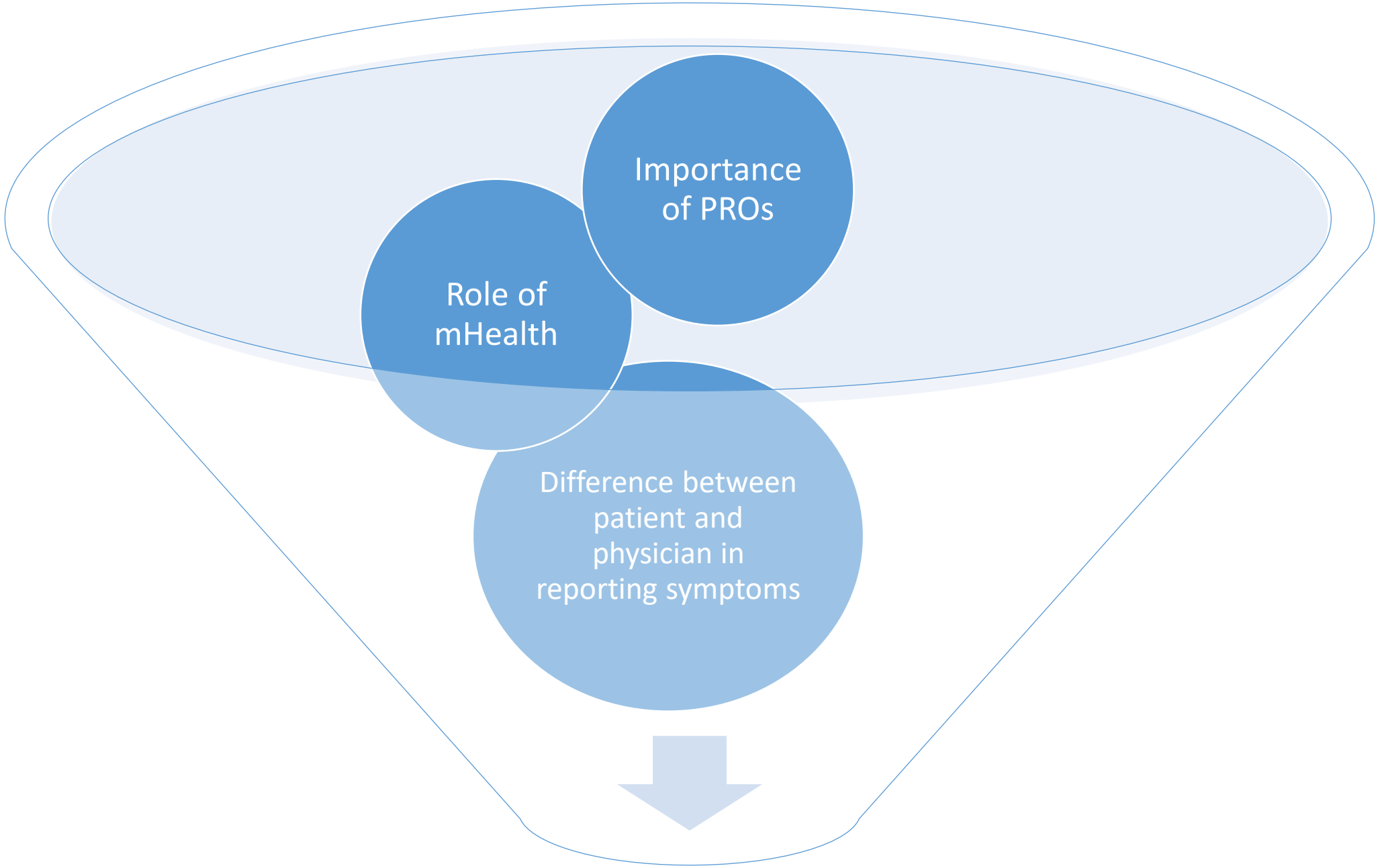
# Differences betweeen patient and physician reported outcomes in prostate cancer

- 1,366 identified men from the CaPSURE database who had been diagnosed in 1995 to 2007 and treated with prostatectomy, BT or EBRT



- Disease specific quality of life was assessed by patients with UCLA-PCI and by physicians indipendently
- Physicians underestimated the degree of participant reported impairment for all domains with a worse scores in late follow-ups
- All patients and physicians documented quality of life using different instruments therefore, patients and physicians might have not been assessing the exact same issue

Sonn Ga, Sadetsky N, Presti JC et al. Differing perceptions of quality of life in patients with prostate cancer and their doctors. J Urol. 2013 Jan;189(1 Suppl):S59-65




Need to develop a specific app

# Materials and Methods

The module development process consists of four phases according to EORTC:

1) generation of relevant QL issues
(Literature, patients, Health care professionals)
2) conversion of the QL issues into a set of items

→ **Development**

3) pre-testing the item list or preliminary module questionnaire
4) large-scale international field-testing

→ **Validation**

EORTC QUALITY OF LIFE GROUP – Guidelines for developing Questionnaire Modules, 2011

# Materials and Methods: Diagram and conceptual framework of a PRO instrument

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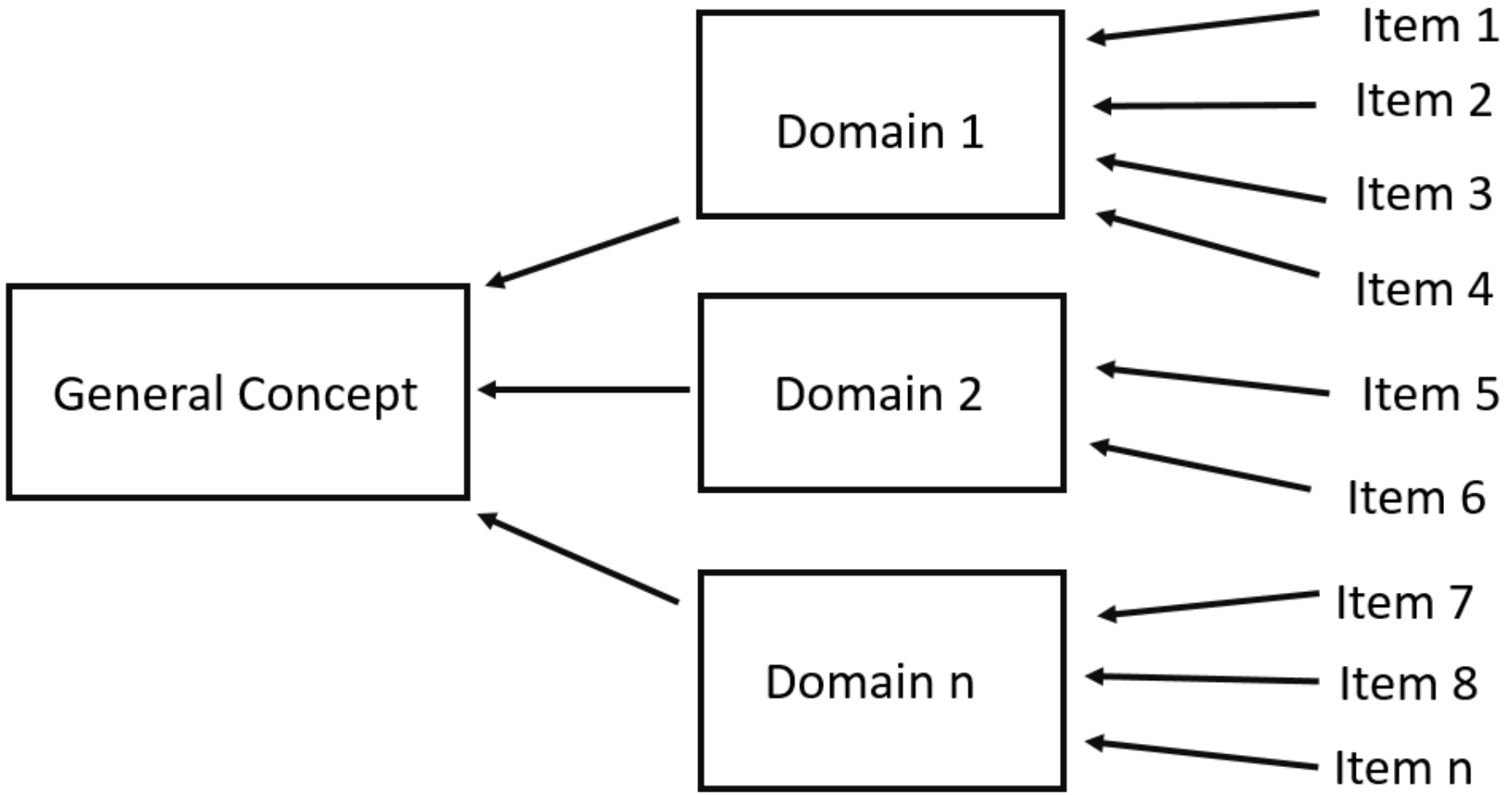
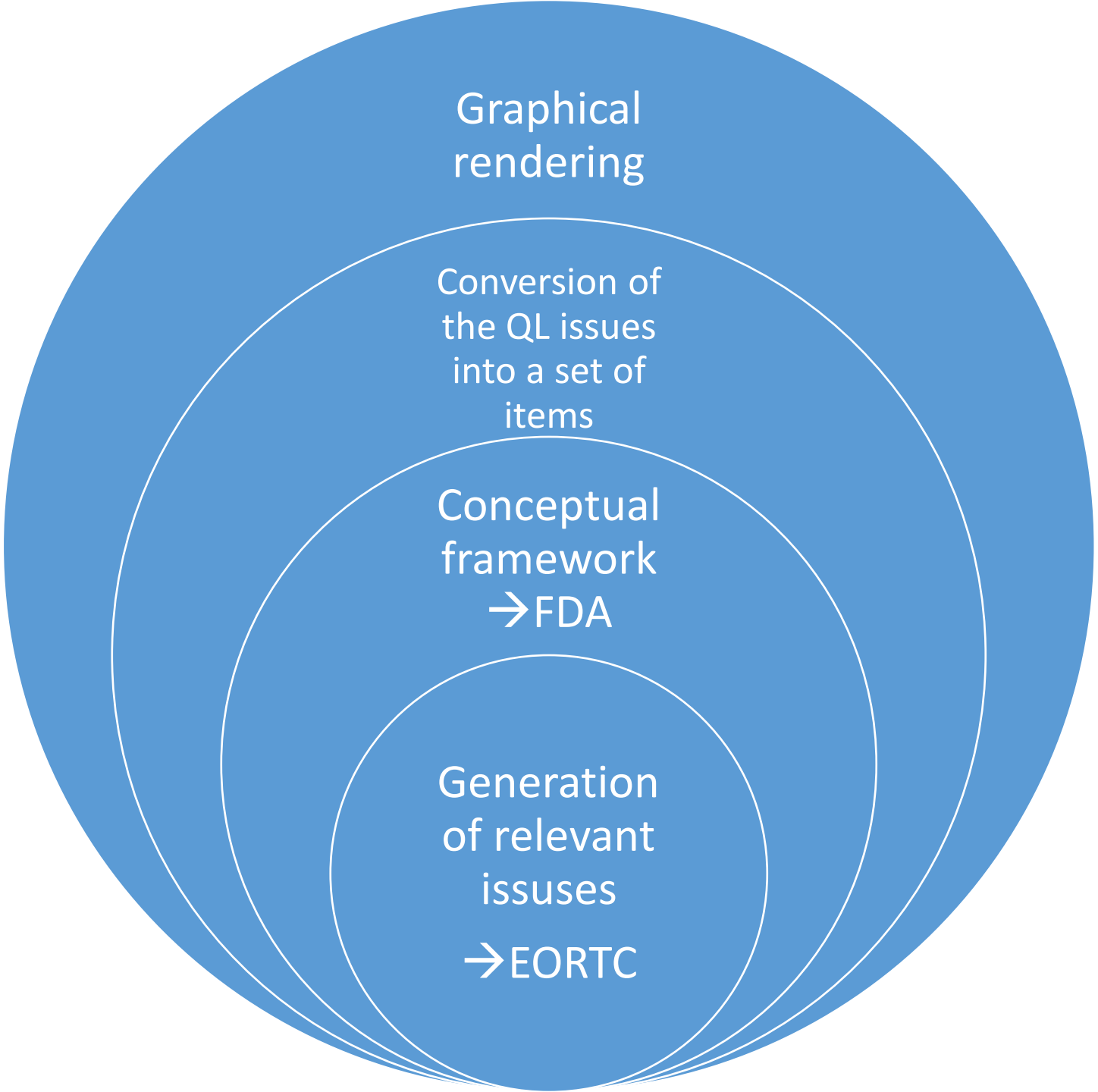



Modified from U.S. Department of Health and Human Services Food and Drug Administration Guidance for Industry: Patient-Reported Outcome Measures: Use in Medical Product Development to Support Labeling Claims. U.S. FDA, Clinical/Medical. 2009


Graphical rendering
Conversion of the QL issues into a set of items
Conceptual framework →FDA
Generation of relevant issuses →EORTC


Application specialist
Psycho-oncologist
Radiation oncologist

# Generation of relevant issues

| | U.F. | U.D. | U.I. | U.B. | I.F. | I.D. | A.P. | I.B. | S.I./S.A./S.E. | H.F. | B.P. | Er.P. | Ej.P. | T. n. I.U. | T. n. I. | Recall Time (weeks) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EORTC QLQ - PR25 | 5 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 18 | 25 | 1 |
| UCLA - PCI | 1 | 0 | 3 | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 3 | 0 | 13 | 15 | 4 |
| EPIC | 2 | 2 | 4 | 2 | 3 | 2 | 4 | 2 | 7 | 2 | 2 | 5 | 0 | 37 | 50 | 4 |
| FACT-P | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 47 | 1 |
| PORPUS | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 11 | 2 |
| PC-QoL | 0 | 0 | 5 | 0 | 1 | 1 | 3 | 1 | 5 | 0 | 0 | 2 | 0 | 18 | 52 | 4 |
| PCSI - SDS | 4 | 4 | 4 | 0 | 2 | 2 | 5 | 1 | 5 | 0 | 0 | 4 | 1 | 32 | 34 | 1/4 |

Van Andel, G., Bottomley, A., Fossa et al. An international field study of the EORTC QLQ-PR25: A questionnaire for assessing the healthrelated quality of life of patients with prostate cancer. European Journal of Cancer. 2008 44, 2418–2424

Esper, P., Mo, F., Chodak, G. et al. Measuring quality of life in men with prostate cancer using the functional assessment of cancer therapy-prostate instrument. Urology. 1997 50, 920–928

Krahn, M., Ritvo, P., Irvine, J. Et al. Construction of the Patient-Oriented Prostate Utility Scale (PORPUS): A multiattribute health state classification system for prostate cancer. Journal of Clinical Epidemiology. 2000 53, 920–930

Wei, J. T., Dunn, R. L., Litwin, M. S. et al. Development and validation of the expanded prostate cancer index composite (EPIC) for comprehensive assessment of health-related quality of life in men with prostate cancer. Urology. 2000 56, 899–905

Giesler, R. B., Miles, B. J., Cowen, M. E. et al. Assessing quality of life in men with clinically localized prostate cancer: Development of a new instrument for use in multiple settings. Quality of Life Research. 2000 9, 645–665

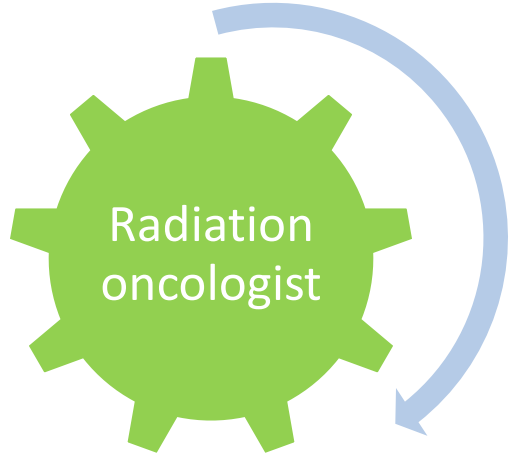
Clark, J. A., & Talcott, J. A. Symptom indexes to assess outcomes of treatment for early prostate cancer. Medical Care. 2001 39, 1118–1130.

Litwin, M. S., Hays, R. D., Fink, A., Ganz et al. The UCLA Prostate Cancer Index: Development, reliability, and validity of a health-related quality of life measure. Medical Care. 1998 36, 1002–1012

# Generation of relevant issues

As shown in the table the number of possible choices for the patients vary significantly from questionnaire to questionnaire and in some cases even within the very same questionnaire

| | |
|---|---|
| **EORTC - PR25** | **1→4**<br>**1=no symptom→4=worst** |
| **UCLA - PCI** | 0→6<br>with a range of 3 to 6 answers and no fixed correlation between severity and number |
| **EPIC** | 0→5<br>with a range of 3 to 5 answers and correlation between severity and increasing number |
| **FACT-P** | 0→4<br>With correlation between severity and increasing number |
| **PORPUS** | No definite number of anwers |
| **PC-QoL** | 1→7<br>with a range of 3 to 7 answers and correlation between severity and increasing number |
| **PCSI - SDS** | 1→5<br>1=no symptom→5=worst |

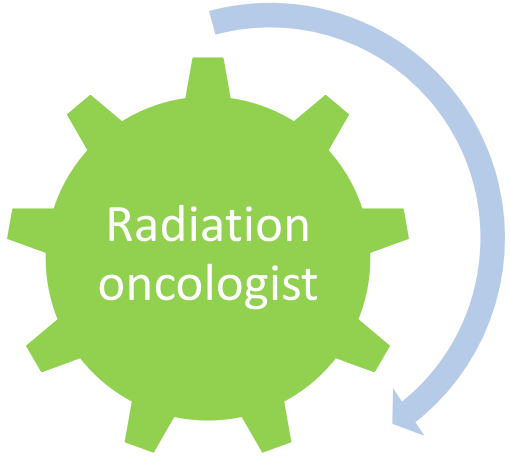


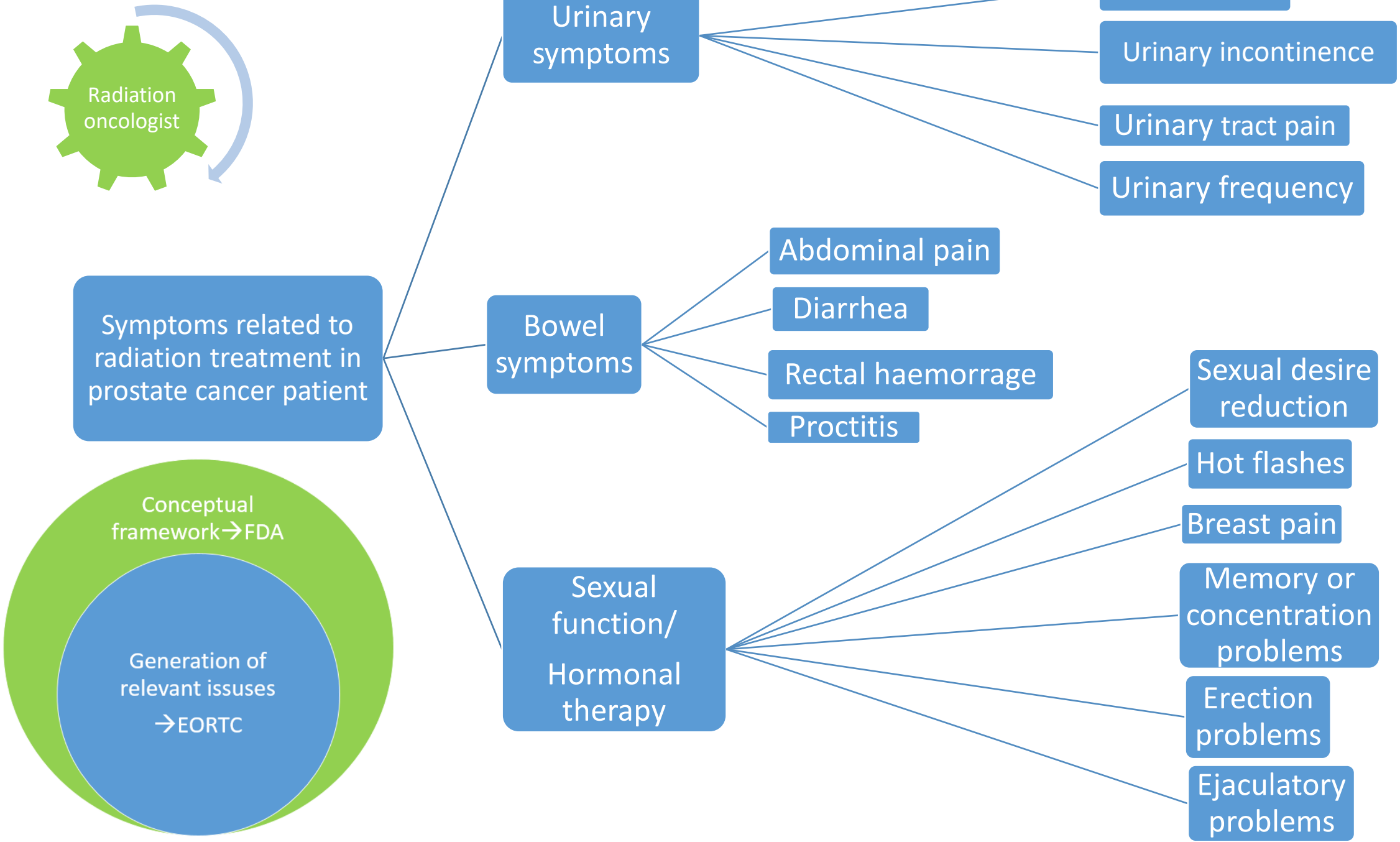

# Generation of relevant issues

This generates at least two orders of problems:

- The first problem is for the patients' perspective because in responding the questions patients face a diversity in the range of possible answers which might in theory be a confounding factor in attributing the choice of the severity of the sympostms

- The second problem is related to the difficulty to compare the results from the different questionnaires





Radiation oncologist
Symptoms related to radiation treatment in prostate cancer patient
Urinary symptoms
Hematuria
Urinary incontinence
Urinary tract pain
Urinary frequency
Bowel symptoms
Abdominal pain
Diarrhea
Rectal haemorrage
Proctitis
Sexual function/ Hormonal therapy
Sexual desire reduction
Hot flashes
Breast pain
Memory or concentration problems
Erection problems
Ejaculatory problems
Conceptual framework→FDA
Generation of relevant issuses →EORTC

# Conversion of the QL issues into a set of items

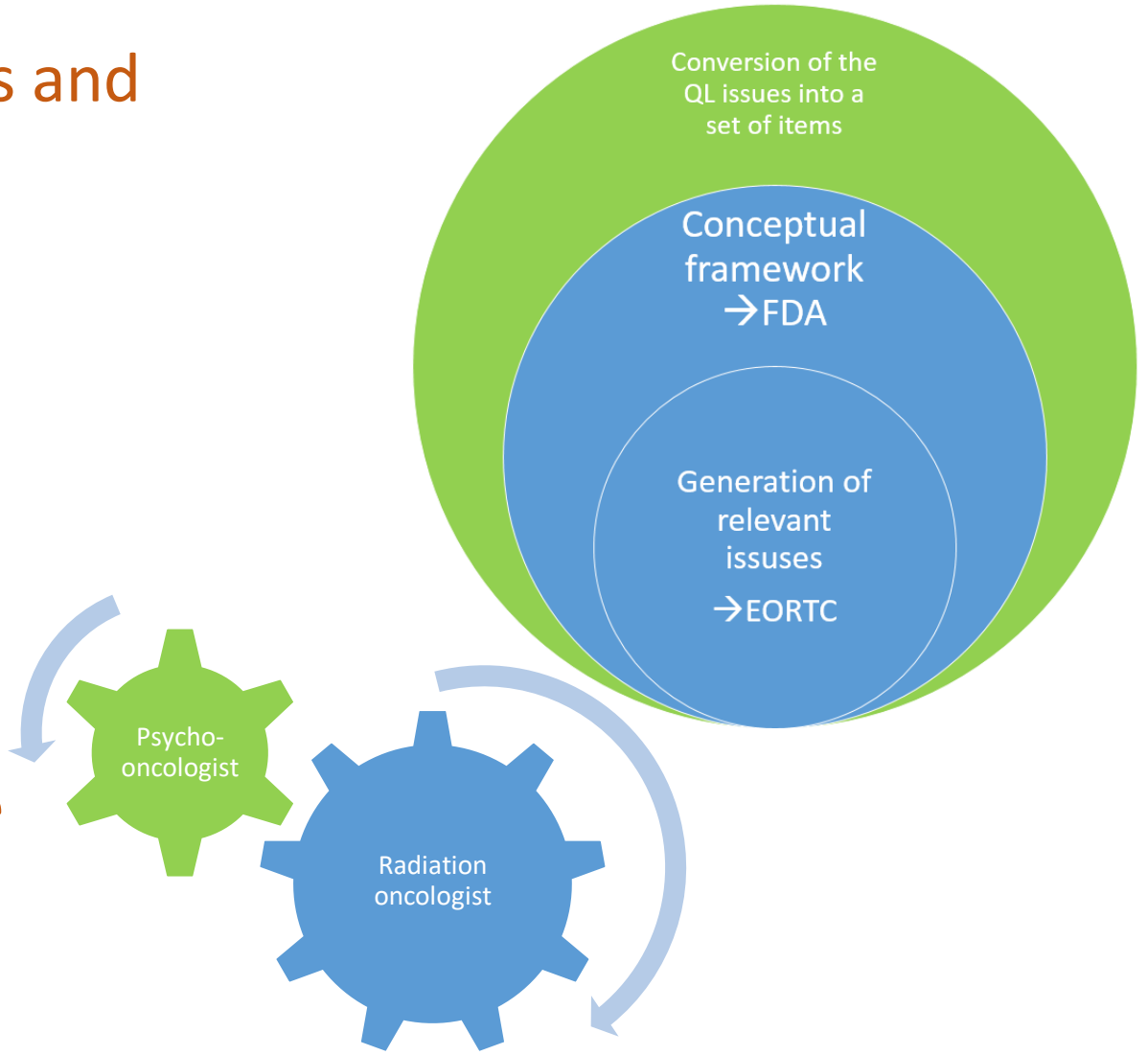
- Choice of CTCAE V 4.03 (Common Terminology Criteria for Adverse Events)
- Most used scale in scientific literature for adverse events reporting
- Linked to medical intervention
- Exclusion of grades 4 and 5

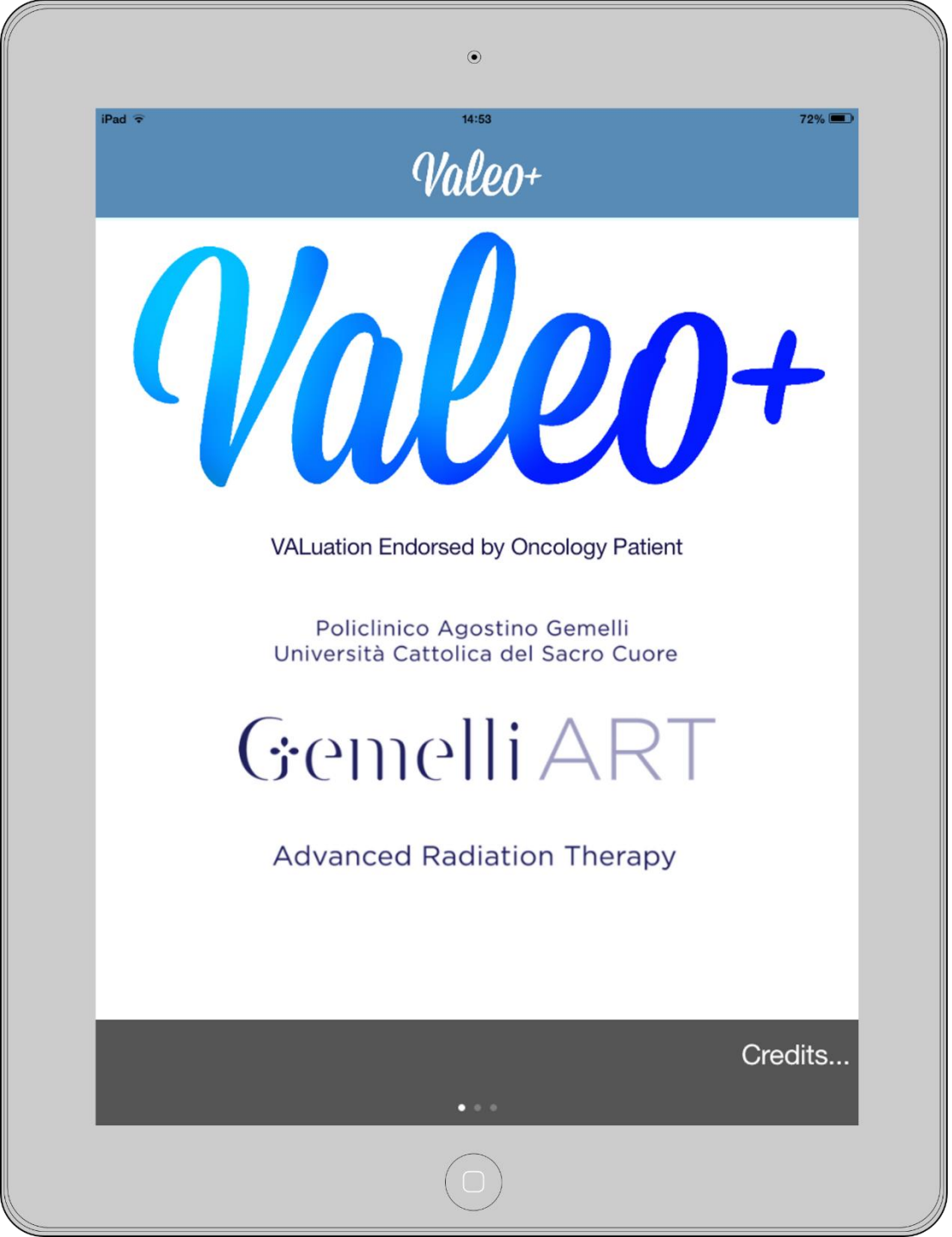
Grade refers to the severity of the AE. The CTCAE displays Grades 1 through 5 with unique clinical descriptions of severity for each AE based on this general guideline:

| | |
|---|---|
| Grade 1 | Mild; asymptomatic or mild symptoms; clinical or diagnostic observations only; intervention not indicated. |
| Grade 2 | Moderate; minimal, local or noninvasive intervention indicated; limiting age-appropriate instrumental ADL*. |
| Grade 3 | Severe or medically significant but not immediately life-threatening; hospitalization or prolongation of hospitalization indicated; disabling; limiting self care ADL**. |
| Grade 4 | Life-threatening consequences; urgent intervention indicated. |
| Grade 5 | Death related to AE. |

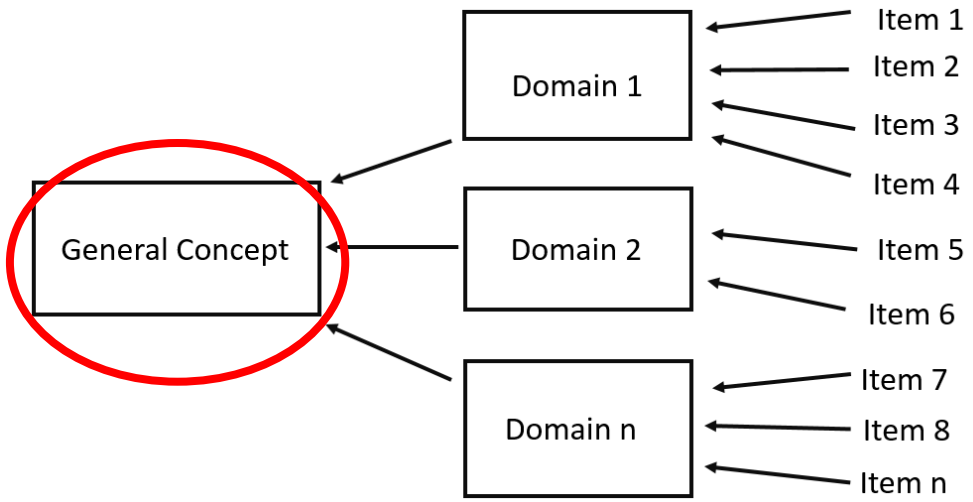
# Conversion of the QL issues into a set of items

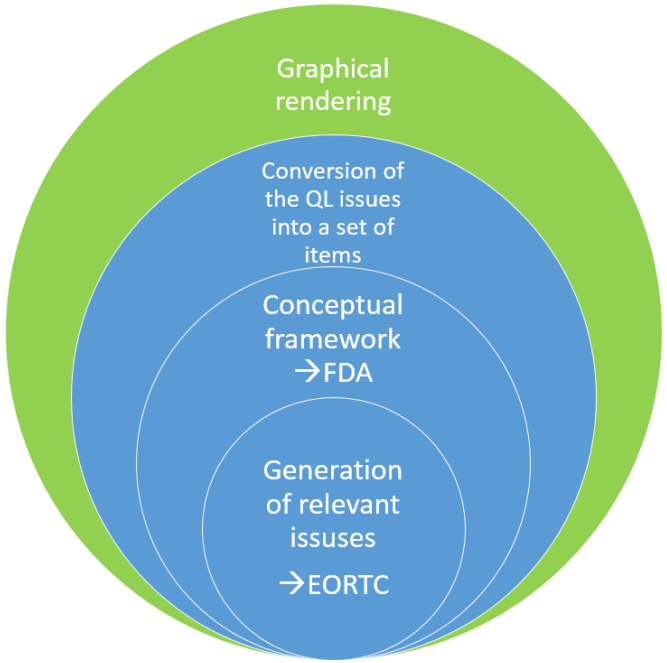
- Wording carried out limiting medical terms and number of words
- Possibility to generate alert signal
- Chance to verify correspondence between PRO and physician
- Possibility of early medical supportive care
- Same event for acute and late

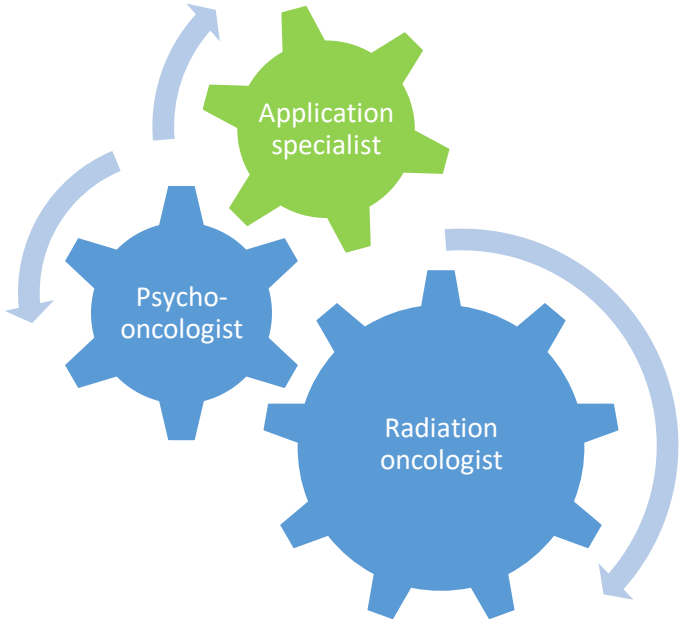





# Graphical rendering

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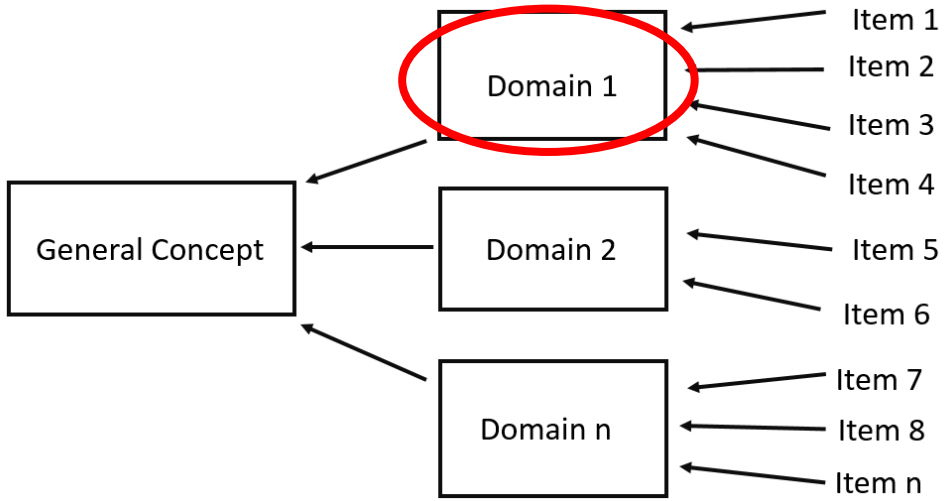


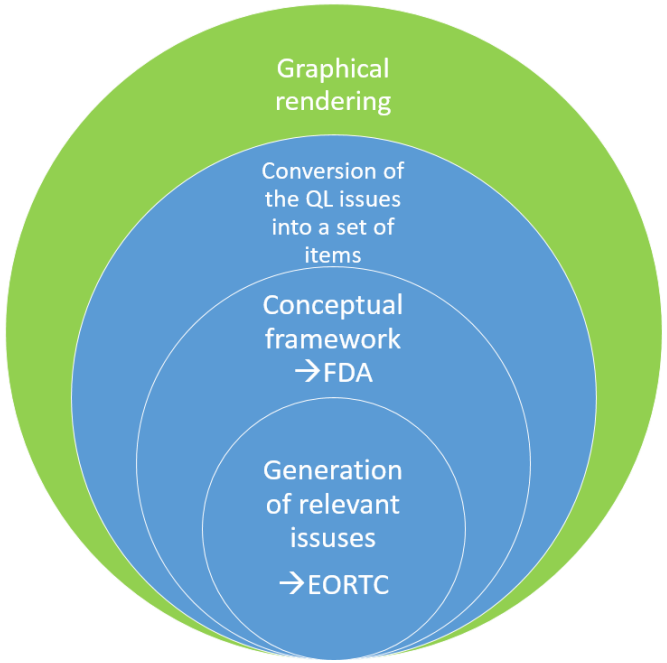


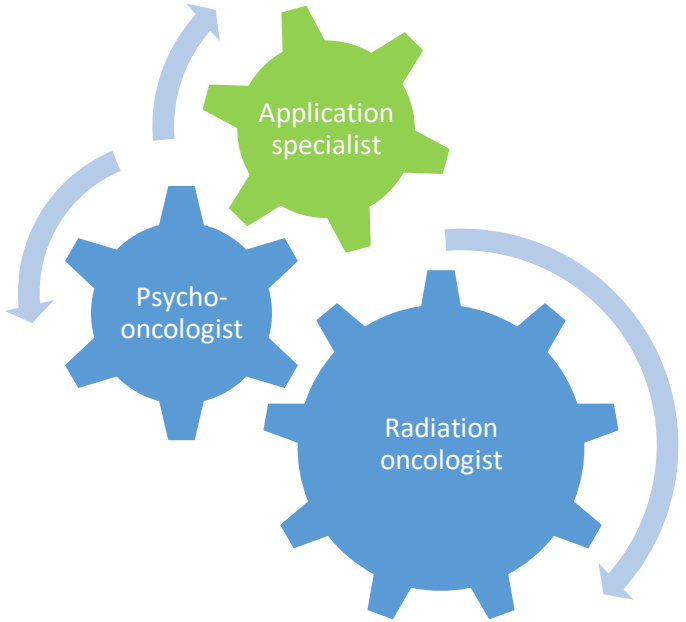


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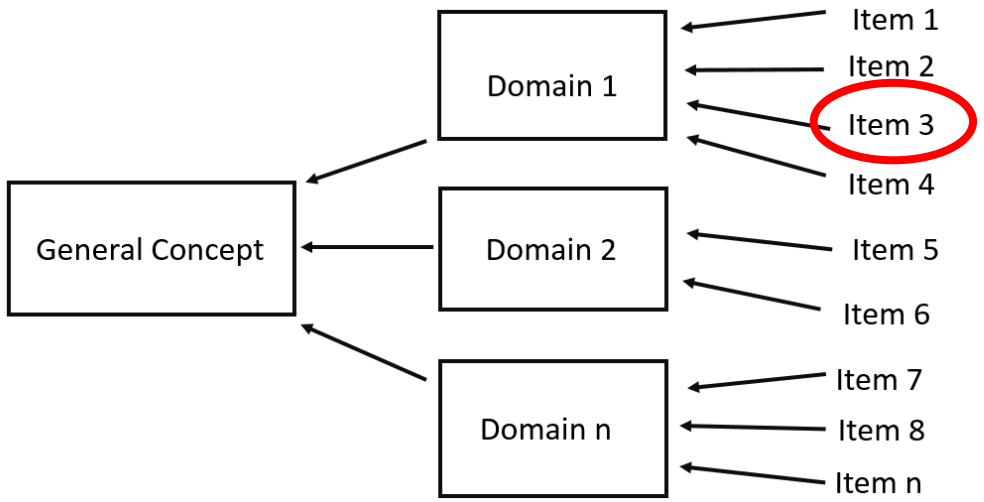


| | |
|---|---|
| | No (assenza sintomo) |
| Grado 1→ Si, leggermente | Si, leggermente (G1) |
| Grado 2→ Si, moderatamente | Si, moderatamente (G2) → Alert |
| Grado 3→ Si, molto | Si, molto (G3) |
| Grado 4→ Non presente<br>Grado 5→ Non presente | |

# Conclusions

- We developed a HRQoL questionnaire for prostate cancer patients specifically intended for mHealth (app)
- The validation might fill-up the gap between PRO and physicians adverse events reporting documented in literature
- This might help collect toxicity data
- Improve patients' HRQoL

# Thank you for your attention

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