Literature Review: Effectiveness of Comprehensive Geriatric Assessment (CGA) and use of Health Related Quality of Life (HRQL) instruments in the management of older patients diagnosed with cancer

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Abstract: *The primary objectives of the literature review were to:*

- *identify literature that reports on impact and effectiveness of CGA in the management of older patients diagnosed with cancer in relation to their quality of life, length of hospital stay and unplanned hospital admissions*
- *evaluate the literature in terms of its methodologies*
- *analyse the published knowledge to identify common themes*
- *to identify best practice as well as gaps in the evidence*

Key wards: Comprehensive. Geriatric, Assessment

Introduction

Comprehensive Geriatric Assessment is a standardised multidimensional clinical process that identifies medical conditions, mental health issues, functional difficulties and social problems in older people. The process involves first screening individuals (compilation of reliable and valid tools to assess geriatric domains) for problems and then targeting those with risks for more in-depth assessment leading to a holistic multidisciplinary treatment plan focussed on patient-centred goals. This approach has shown that CGA effectively improves health outcomes and reduces hospital admissions and readmissions in older people with multiple problems, (Stuck et al., 2005 Anderson et al., 2005, Ellis et al., 2003, Wells et al., 2003). Integrated care between acute care specialists, GPs, therapists, nurses and social care is an important aspect of this intervention.

Evidence for the value of integrating CGA in oncology is increasingly being documented in the literature (Baldicci et al., 2000, Repetto et al., 2003, Extermann et al., 2005). The main objectives of introducing CGA in oncology are to

- provide an estimation of life expectancy and to understand the impact of cancer on patients remaining life
- identify medical and social problems that decrease the tolerance of cancer treatment
- formulate the most appropriate treatment and management strategies
- monitor outcomes

The perceived barriers to practical implementation of CGA include time, familiarity and cost implications (Rodin et al., 2007). There have been many attempts to identify a reliable and cost effective instrument for assessment and to help determine which cancer patients will benefit the most from full multidisciplinary CGA intervention. For example:

- A self assessment CGA produced very similar assessment result to the one obtained by trained health care professional (Ingram el al., 2002).
- A 'minimal' CGA was developed and evaluated in elderly patients with prostate cancer. The study revealed the presence of problems that were not known prior to screening such as drug interactions, cognitive deficit, depression and malnutrition (Ovecash et al., 2003, Exterman et al., 2005).
- A combination of the self-administered questionnaire and brief physician assessment proved feasible to identify the CGA needs in less than 30 minutes (Hurria et al., 2006).

However, most of these studies have focused on the ability of CGA as a screening tool to identify prognostic factors and very few studies focused on the ability of a CGA based intervention to influence the process of care for older cancer patients and outcomes in respect to the quality of life of older patients undergoing cancer

treatment. No studies have tested the ability of a CGA based intervention to influence the process of care for older cancer patients within oncology inpatient settings.

Search Strategies

The review considered international literature published between 1996 and 2012. Unpublished data has not been included. In addition to searching electronic databases, reference lists of relevant studies were scanned to identify further studies of interest.
Full strategy and advanced search terms for Ovid Medline and Embase search were conducted (Figure 1) .
The search terms were refined for each database according to appropriate syntax and searching requirements.
To avoid the risk of missing potentially relevant studies inclusion criteria were broadly defined to include studies written in any language, conference abstracts and their corresponding full report (table 1).
Titles and abstracts of all retrieved publications were reviewed and a large number were excluded after applying the exclusion criteria, table 2.
In addition, other studies were identified by reviewing the reference list of key articles and by asking experts in the field to recommend relevant papers and books.

Table 1: Inclusion criteria

- Including patients age 65+
- Addressing the care of older cancer patients
- CGA and HRQOL studies reporting association with each other
- Studies including CGA assessment + intervention
- Studies including Nurse Led CGA assessment + intervention
- Conference abstracts

Table 2: Exclusion criteria

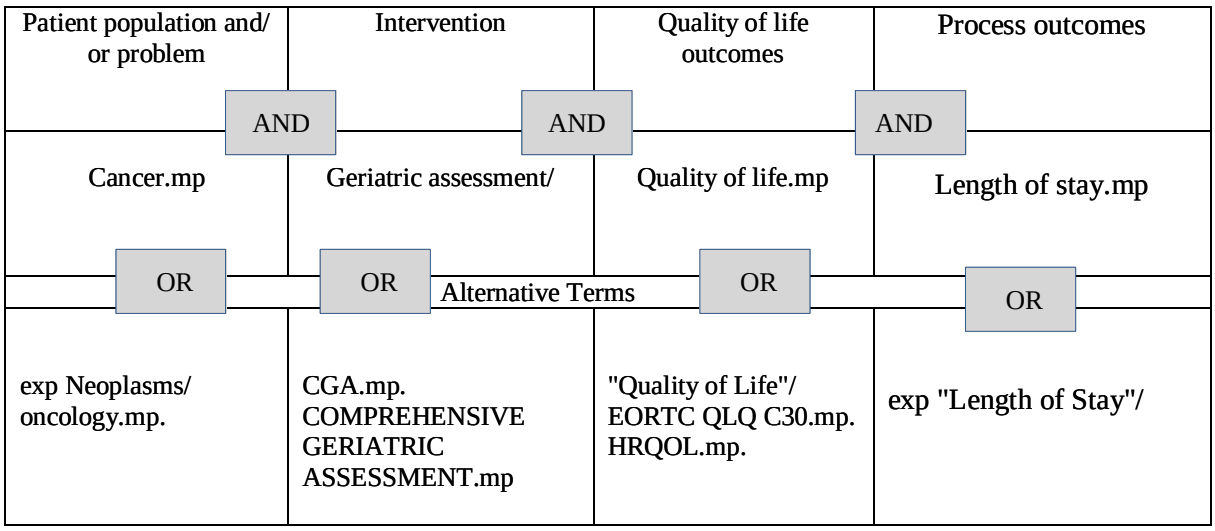
- Publications related to patient population under the age of 65
- Generic overviews without evaluation: commentaries, letters and editorials
- Conference proceedings and abstracts if the same result were presented in a later research paper
- Studies using CGA to provide simple description of the baseline characteristic of population without formal evaluation or intervention
- Studies highly specific to cancer survivals
- Studies highly specific to patients managed with surgical intervention only
- Case study reports

Results of the search

The search yielded 647 hits, of which all available abstracts were reviewed. After duplicate citations were removed, 586 papers were reviewed of which 58 met the inclusion criteria. Following full review 10 papers were selected as relevant. In addition, 2 papers were obtained from secondary sources as quoted in reviewed articles.

The main reason for exclusion was the lack of specific focus on reporting HRQOL outcomes following CGA intervention in study findings. Eighteen papers were rejected as highly specific to cancer survival. Large numbers of papers were excluded because CGA was used only to describe the study population without evaluating its impact.

Figure 1: Search strategy



Characteristics of papers reporting Health Related Quality of Life (HRQL) outcomes

The Minimum Standard Checklist developed by Efficasse et al., (2003) was used to record the methodology of included QoL related studies and the descriptive synthesis of data was undertaken as presented in table 3. Robustness of synthesis was assessed by critical reflection and data was analysed in themes (Efficasse et al., 2003).
Literature review results related to CGA intervention and its impact on patient's cancer care is presented in Table 4.

Table 3: Minimum Standard Checklist for Evaluating HRQOL Outcomes in Cancer Clinical Studies

HRQOL Issue	Answer	Description
Conceptual		
A priori hypothesis stated	Yes N/A	Assessed whether authors have pre defined HRQOL end point and/or stated expected changes because of the specific treatment.
Rationale for instrument reported	Yes No	Assessed whether authors gave a rationale for using a specific HRQOL measure.
Measurement		
Psychometric properties reported	Yes No	Assessed whether a previously validated measure was used or psychometric properties were reported or referenced in the article.
Cultural validity verified	Yes N/A	Assessed whether the measure was validated for the specific study population.
Adequacy of domains covered	Yes No	Assessed whether the measure covered, at least, the main HRQOL dimensions relevant to geriatric cancer population or according to research question.

Methodology		
Instrument administration reported	Yes No	Assessed whether authors specified who and/or in which clinical setting the HRQOL instrument was administered.
Baseline compliance reported	Yes No	Assessed whether authors reported the number of patients providing an HRQOL assessment before the start of treatment.
Missing data documented	Yes No	Assessed whether authors gave some details on HRQOL missing data during the trial.
Interpretation		
Clinical significance addressed	Yes No	Refers to the discussion of HRQOL data being clinically significant from a patient's perspective and not simply statistically significant.
Presentation of results in general	Yes No	Assessed whether authors discussed the HRQOL outcomes, giving any comments regardless of the result (either expected or not).

The use of HRQOL instruments in selected studies

All selected studies reported HRQOL in older patients using one or more instruments (Table 4). The EORTC QOL-C30 was the most frequently used self-reported questionnaire (3/7 studies). Disease –site specific modules was used in one study.
Definition of HRQOL was provided in 3 studies (Bauman et al., 2009, Esbensen et al., 2006 and Eygor et al., 2009). Only one study (Bauman et al., 2009) provided a definition of HRQOL and this was consistent with The World Health Organisation (WHO: 2008) definition of HRQOL.
Rational for choice of instrument was provided in 4 studies and cultural validity partly reported in 5 out of 7 selected papers. Most of the studies reported compliance and timing of assessment. Two studies did not report instrument administration methods.
Little attempt was made to test usefulness of the HRQOL instruments used especially in consideration of factors such as education level and frailty of the participants. The majority of the studies used an existing instrument and no study provided evidence on reliability, validity, applicability and feasibility of the instruments used.

Studies design

Various methodologies have been used in selected studies reporting on HRQOL outcomes (Table 4). However, only 2 studies (Mantovani et al., 1996, Rao et al., 2005) reported HRQOL in older cancer patients within the context of a randomised controlled trial (RCT). Studies using qualitative methods were not identified.
The country with largest number of studies was the United States of America (USA). None of the studies identified were done in the UK.

Patient population

Table 5 summarises the age range of patients across the studies included. Apart from two (Bauman et al., 2009 and Eygor et al., 2009) all studies included patients aged 65 and over. The oldest patient included in the selected studies was aged 87 (Chen et al., 2003). The range of ages is variable in all studies which demonstrated the problems and inconsistencies with the definition of 'older patients'
Most of the studies measured HRQOL in the outpatient population. Only three studies (Bauman et al, 2009, Chen et al., 2003, Eygor et al., 2009) focused on measuring HRQOL outcomes in hospitalised cancer patients.

Table 4: Literature review results related to CGA intervention and its impact on patient's cancer care

Cancer/Comprehensive Geriatric Assessment/intervention

Title Author/Year of publication/country	Methodology	Main findings/Summary	Comments/Limitations Recommendations
1. A comprehensive geriatric intervention detects multiple problems in older breast cancer patients Extermann, M., Meyer, J., McGinnis, M. et al., (2003) USA	Observational pilot study Participants: 15 early breast cancer patients, aged 70 and older with a recent diagnosis of stage I or II breast cancer, coming for their initial outpatient visit. All patients received a multidisciplinary CGA every 3 months and structured follow-up from the nurse practitioner, dietician, social worker, and pharmacist according to risk. Total follow-up was 6 months.	Number of patient participating in the study: 11 Median age: 79 The intervention directly influenced oncological treatment in 4/11 cases (36%). . It ensured continuity/coordination of care in seven cases. Success rate in addressing problems was 87%.	The study was set to assess the feasibility of enrolling older cancer patients into a trial and implementing a coordinated multidisciplinary intervention. It stands out from other studies as it is the first study testing CGA coordinated intervention and it's direct or indirect impact on patients cancer care. However, there is no explanation on how was influence on oncology treatment measured. Is this based on feedback from oncologist or authors' interpretation of it?
2. Geriatric Syndromes in Elderly Patients Admitted to an Oncology–Acute Care for Elders Unit Flood, K., Maria, B., Carroll, C. V. et al., (2006) USA	Retrospective Observational Study Retrospective review of 119 patients age 65 years or older who had a primary oncology or hematology diagnosis and were admitted to the Oncology Acute Care for Elderly Unit (OACE).	Number of patient participating in the study: 119 Median age: 74.1 Geriatric syndromes detected by the interdisciplinary team included: cognitive impairment (dementia and/or delirium), depression, weight loss, and use of high-risk medications.	Many older cancer patients were found to have geriatric syndromes and these patients were considered appropriate for an interdisciplinary model of care. The results of the ADL screens may be biased because most patients gave a self-report of their functional status without further evaluation. Taking into account the prevalence of cognitive impairment, self-reported outcomes without formal medical evaluation are not the best method of screening.
Title	Methodology	Main findings/Summery	Comments/Limitations

Author/Year of publication/country			Recommendations
3. A pilot study on frailty, health and functioning in older newly-diagnosed cancer patients, what have we learned? Puts, M.T. J., Monette, J.Girre, V. et al., (2011) Canada	Prospective cohort pilot study Study included newly-diagnosed patients aged 65 and over, with breast, colorectal, or lung cancer or lymphoma or multiple myeloma who had not received cancer treatment in the previous 5 years.	Number of patient participating in the study: 113 Mean age: 74.1 Pilot sowed that it was feasible to recruit and retain older newly-diagnosed cancer patients to the study although it required much more effort than anticipated. Study uncovered some of the challenges in relation to use of selective measurement tools and concluded that most of used measures were acceptable and feasible	CGA domains referred to as 'frailty markers'. Study demonstrates the usefulness of conducting pilot work prior to launching larger studies. It also identified potential challenges that can be taken into consideration when new study involving older patient with cancer is considered and designed. Although, recommendations were provided in regards to future studies effect of frailty markers were not clearly explained and no recommendation was provided Good sample size for the pilot but to many variables and therefore not powered to perform multivariate analyses.
Effect of Nurse Case Management on the Treatment of Older Women with Breast Cancer Goodwin, J.S., Shiva Satish, M.D. et al., (2003) USA	Randomised Control Trial Women aged 65 and older with newly diagnosed breast cancer were eligible for trial. Intervention: Women seeing surgeons were randomized to the intervention group and in addition received the services of a nurse case manager for 12 months after the diagnosis of cancer. .	Number of patient participating in the study: 335 patients (166 control and 169 intervention) Control group: 72.9 Intervention group: 71.8 More women in the intervention group received breast-conserving surgery (28.6% vs 18.7%) and radiation therapy (36.0% vs 19.0%).	The study was consistent of a clinical intervention and ongoing decision-making by a clinician for each individual patient. Because of this it is difficult to determine which aspect(s) of the intervention contribute to its overall effect and therefore it is not possible with the information we are given through out the study to identify which specific activities of the nurse case managers were associated with improved outcomes.
5. A specialised home care intervention improves survival among older post-surgical cancer patients Mc Corkle, R., Strumpf, N.E. et al., (2000) USA USA	A randomized controlled study 375 patients aged 60 to 92, newly diagnosed with solid cancers and were treated surgically	Overall, the specialized home care intervention group was found to have increased survival (p = .002) 2-year survival among late stage intervention group cases was 67% compared with 40% among control cases	This is the first and only empirical study post treatment cancer patients to link Clinical Nurse Specialist intervention with improved survival.

Statistical analysis

Five out of seven studies have only a descriptive presentation of data and only 2 studies have reported the clinically significant data. Missing data was documented in only one study. A test of statistical significance was applied in both RCT studies but only one study reported a difference between the treatment and control group.
All studies using the EORTC QOL-C30 questionnaire have used instructions of the manual provided by the EORTC QOL group (Fayers et al., 2001) for statistical evaluation of the results.

Finding and critique of the literature reporting on HRQOL outcomes in management of older patients with cancer

The Majority of studies recognise that efficacy of cancer treatment in older patients needs to measure impact of the disease and treatment on patients HRQOL, as well as mortality rates (Bauman et al., 2009, Hurria et al., 2006, Chen et al., 2003).
However, only two studies (Eyigor et al., 2010, Rao et al., 2005) focused on the impact on HRQOL of a CGA based intervention in management of older patients with cancer. In contrast to the CGA geriatric literature (Stuck et al, 2005, Anderson et al, 2005, Ellis et al, 2003) where CGA is used as a tool to identify patients' needs and provide targeted information to improve outcome, studies in oncology mainly approached CGA as a means of describing and risk stratifying the patient population.

Following secondary subset analyses from RCT, Rao et al., (2005) suggested that CGA based intervention impacts on HRQOL of the elderly cancer inpatients – especially in the domains of pain management mental health. However, this finding was not definitive considering subset analyses.
Overall, there was no significant difference in HRQOL in older person with cancer, when compared with younger patients (Bauman et al., 2009). No significant changes in HRQOL were identified at the 3 months follow up **(**Esbensen et al., 2006, Hurria et al., 2006).
Factors related to low HRQOL outcomes were related to high functional dependency, reduced economic ability and a low level of hope (Esbensen et al., 2006).
This review has provided useful information on how HRQOL can be measured and the challenges that needed addressing in future research.
The review also highlighted number of conceptual and practical shortcomings. No qualitative studies have been identified throughout this review.
Inconsistencies around definition of HRQOL and tools used to measure it highlighted issues around perception and resulting in subjective interpretation of the results.

Characteristics of papers reporting on CGA intervention and its impact on patient's cancer care

Out of five identified studies (Table 7) two referred to CGA intervention within the context of RCT (Mc Corkle et al., 2000 and Goodwin et al., 2003). Both studies an intervention was the introduction of a clinical specialist nurse in the community settings. Two studies (Extermann et al., 2003 and Flood et al., 2006) were reported in context of observational pilots and one study (Puts et al., 2003) was conducted within the context of retrospective observational analyses. All studies were empirical and included patients age 65 and above.

Findings from the literature review

Most of the studies within the literature review focused on determining the prevalence of functional dependences and geriatric syndromes in this patient population (Flood et al, 2011, Exterman et al., 2003). Pilot studies included in this review, have provided us with valuable information about the feasibility of using the CGA approach in older cancer patients and uncovered challenges that allowed future studies (including this one) to modify methodology and accommodate these issues. The pilot study conducted by Extermann et al., (2003) also demonstrated that a CGA with follow up has potential for improving the treatment and prognosis of these patients.
This is supported in McCorcle et al., (2000) study which showed a significantly improved survival using intensive CGA intervention post operatively in patients with advanced cancer.

Despite increasing evidence that the value of CGA in the management of cancer patients is of value (Balducci et al., 2000, Extermann et al., 2003) no prospective studies of CGA based intervention have yet been conducted and tested in the UK oncology inpatient setting. No studies have examined the impact of a CGA based

intervention on process outcomes such as length of hospital stay. This review has established the need for this study and an evidence base to support it.

Limitations of the review

The literature review was based on all literature regardless of methodological quality in order to give a broader picture of existing research. This may have introduced interpretation bias of evidence from the less robust studies taking equal prominence as the larger better quality pieces of work. A second/third reviewer would allow for a more robust review.

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