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# **Nutrition assessment: Implementation of sarcopenia and frailty assessments of potential liver transplant recipients**

Initiative Type

Service Improvement

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Sustained

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## **Summary**

Management of end stage liver disease is often complicated by sarcopenia and frailty (1,2). New evidence-based guidelines recommend that pre-transplant nutrition assessment should incorporate

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measures of sarcopenia and frailty (3), however these had not traditionally been performed as part of dietetic practice in Australia, including the Queensland Liver Transplant Service. Using an implementation science approach, we needed to determine if these guidelines were feasible and acceptable and could be sustained in clinical practice. This project shows that we have successfully done this, and that the assessments are utilised to provide valuable data to support clinical decision-making regarding wait-listing for liver transplant. Protocols have been developed to assess for sarcopenia and frailty in the liver transplant population, which have the potential to be translated to other clinical conditions exposed to the same complications to enhance the assessment and care.

#### Key dates

Sep 2017

Sep 2020

#### Implementation sites

Princess Alexandra Hospital

#### Partnerships

Queensland Liver Transplant Service and the University of Queensland

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## Aim

To determine the feasibility and acceptability of implementing sarcopenia and frailty assessments as a component of the dietitian assessment of potential liver transplant recipients

## Benefits

- Quality care requires health professionals to improve evidence uptake and identify barriers to change at a local level. This study demonstrated that dietetic assessment of muscle mass and physical function to diagnose sarcopenia and frailty is a reliable, feasible and acceptable component of the liver transplant assessment process, valued in clinical decision making.
- We have closed the evidence-practice gap through implementation of evidence-based guidelines (assessment of sarcopenia and frailty) into standard clinical care and demonstrated this is also sustainable in clinical practice.
- Analysis of pre-existing computed-tomography (CT) scans to diagnose sarcopenia by a dietitian produced similar results to health professionals who regularly view CT scans. This adds value to the role of the dietitian by advancing their scope of practice in the area of body composition analysis through analysing CT scans.
- Correctly diagnosing sarcopenia and frailty for these potential liver transplant recipients at the initial stage of the listing process provides an opportunity to refine risk assessment for organ allocation and may enable opportunities to intervene with "pre-habilitation" approaches.
- Where the assessment of physical status has historically been based on a clinician's subjective "end-of-bed" assessment, having the formal diagnosis of sarcopenia and frailty provides objective and meaningful data which can also be followed longitudinally along the transplant wait-list.
- Prevalence data is now be collected longitudinally to determine the impact of sarcopenia and frailty on the transplant journey, which will assist with addressing these issues pre-transplant moving forward, where there is limited evidence to date.

## Background

Patients with end stage liver disease are often frail with severe muscle wasting and impaired muscle function (sarcopenia) (1,2). Whilst receiving a liver transplant saves lives, patients often wait for a transplant and the presence of sarcopenia and frailty whilst waitlisted is linked to poorer prognosis.

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Newly released evidence-based guidelines recommend assessment of sarcopenia in the pre-transplant nutrition assessment (3). The Queensland Liver Transplant Service (QLTS) had not traditionally incorporated these measures into clinical practice and in 2018 the dietetic service was not performing these assessments as part of standard dietetic care. Measures of sarcopenia and frailty have the potential to refine risk assessment during the transplant evaluation process; and in determining relative priority of potential recipients during organ allocation. Sarcopenia diagnosis requires evidence of reduced muscle mass and impairment of strength or function (3). Sarcopenia and frailty in potential liver transplant recipients is associated with poorer outcomes (4,5).

## Solutions Implemented

The Knowledge to Action (KTA) Framework was utilised to guide the implementation, dissemination and review of this 18 month project.

- After we identified the problem, we adapted knowledge to our local context through engaging partnerships with key stakeholders including an Exercise Physiologist with frailty experience, Liver Transplant Specialist with body composition expertise, a radiologist, a CT image specialist, and a Research Fellow to guide implementation.
- The most appropriate assessment tools to define sarcopenia and frailty were determined and implemented in March 2018. To measure sarcopenia, we
  - Used existing CT scans to assess muscle mass
  - Hand Grip Strength to test muscle strength
  - The Short Physical Performance Battery to test physical function and performance
  - The Liver Frailty Index was selected to assess frailty (6)
- After selecting the most suitable assessment tools, data collection and assessment protocols were developed for analysing existing CT scans and completing the assessments by the dietitian in the clinic.
- An agreement was made among the team as to where the results would be reported in the patient's electronic chart to ensure it was accessible for transplant assessment meetings.

## Evaluation and Results

We assessed the feasibility of implementing the functional tests as part of sarcopenia and frailty assessments. Patient's perspectives were:

- 97% of patients were able to complete the tests
- 100% of patients reported they were acceptable to complete
- the average confidence score was 8/10 ( $\pm 1.8$ ), with no adverse events associated.

System-related factors that were explored found:

- The average time taken to complete the functional tests in clinic was 7 ( $\pm 1.6$ ) minutes per

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patient

- 78% had a CT available for muscle mass analysis

The reliability of CT analysis of muscle mass for sarcopenia diagnosis was also determined on a subset (n=21) of patients between a dietitian and two independent experts (a radiologist and radiation therapist).

- Inter-observer agreement for CT analysis of skeletal muscle mass (dietitian vs two experts) was excellent, with an Intra Class Co-efficient ICC of 0.974 (0.947 – 0.988 95% CI), and Kappa statistic of 0.932 for sarcopenia diagnosis

Following implementation, to monitor knowledge use and assess clinicians' value and acceptability of the sarcopenia and frailty assessments, a staff survey was developed using the Theoretical Domains Framework (7). Clinicians were invited to complete this 6 months post implementation. There was an 80% completion rate with positive results indicating:

- 100% of the clinicians involved in waitlist decision making considered sarcopenia and frailty in their assessment for transplant suitability.
- 100% believed a dietitian was suitable to perform tests
- 97% of responders thought the functional and frailty assessments should be implemented into standard care, whilst 67% felt CT analysis of muscle mass should be implemented into standard care.
- 58% of clinicians did not perceive any barriers to implementation. Those who did, queried the validity & standardisation of the measures, had concerns regarding learned behaviours on repeat assessments, and cost of resources.

### **Sustaining Knowledge Use**

- Following the 12-month implementation we evaluated the sustainability of practice change. This important because the clinic dietitian changed. Sustainability was measured based on assessments being completed at initial appointments and repeated within appropriate time frames at reviews– defined as within two-months for high risk, and within four-months for lower risk patients
- 92% of patients had the assessments completed and 60% of these occurred within the appropriate timeframe. Factors related to non-completed reviews included 44% were institutional related factors (time constraints, scheduling, resources such as interpreter / equipment not available), 31% were patient related factors (patient failed to attend, left before seeing the dietitian) and 26% were clinical related factors (Inpatient or patient too unwell).

### **Lessons Learnt**

The engagement with the clinical staff in determining acceptance and value of the new assessments in decision-making was crucial to the success of the implementation. There is little point in “following guidelines” if the information is never used in clinical decision making or informing patient care priorities. Following implementation, it is important to assess the sustainability of knowledge use, to

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identify barriers/requirement for further changes and ensure the longevity of the practice change – this will help us to further refine the protocols and integration of a broader multidisciplinary team.

## References

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