MANCHESTER 1824
The University of Manchester

NHS
National Institute for Health Research
Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Greater Manchester

Evaluation Report

Functionality and Feasibility of an Electronic Long-term Conditions Integrated Assessment Tool (GM-ELIAT)

A Pilot Project

NIHR CLAHRC for Greater Manchester is a collaboration of Greater Manchester NHS Trusts and the University of Manchester, and is part of the National Institute of Health Research

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

ACP	Advanced Care Planning
ACT	Asthma assessment test
ADL	Activities of Daily Living
AF	Atrial fibrillation
AHPs	Allied Health Professionals
BPI	Brief Pain Inventory
CAT	COPD Control Test
CCGs	Clinical Commissioning Groups
CIs	Confidence Intervals
CKD	Chronic Kidney disease
CM	Community Matron
CVD	Cardiovascular disease
ERP	Electronic Patient Record
FRAT	Fall Risk Assessment Test
GAD-7	Generalised Anxiety Disorder Assessment (GAD-7) score
GM-ELIAT	Electronic LTCs Integrated Assessment Tool
HAD	Hospital Anxiety Depression Scale
HCP	Healthcare Professional
HF	Heart Failure
IM&T	Information Management and Technology
LOS	Length of (hospital) stay
LTC	Long-term Conditions
MARS	Medication Adherence Report Scale
MD	Mean Difference
NHS IQ	NHS Improving Quality
NYHA	New York Heart Association
OT	Occupational Therapist
PHQ-9	Physical Health Questionnaire
PDSA	Plan-Do-Study-Act
QOF	Outcomes Framework
SAP	Single Assessment Process
SD	Standard Deviations
SOB	Shortness of Breath
SRFT	Salford Royal Foundation Trust

Executive Summary

Introduction

This pilot project was designed to test the functionality and feasibility of a prototype Electronic Long-term Conditions (LTCs) Integrated Assessment Tool (GM-ELIAT) within a community matron service. The GM-ELIAT provides an integrated, individualised holistic assessment involving physical, psychological, social and spiritual needs for patients either referred to a community service, such as a community matron team or for patients referred to an integrated team. The GM-ELIAT has been designed to identify and address unmet needs, identify co-morbid risk, reduce the time spent on the assessment process in comparison to paper based forms, enhance the quality of assessment by the use of a range of risk assessment tools, and standardise the assessment process for patients with multimorbidity across an integrated health and social care team. The prototype tool has been built in excel and does not currently have sharing capabilities, however, the exploration of available clinical systems is underway to assess the feasibility of integrating the tool into such systems. This report will focus on the feasibility of the tool in its current format and not the exploration of clinical systems.

Background

LTCs such as cardiovascular disease (CVD), diabetes and respiratory disease are the leading cause of disability and death in the western world. Due to an aging population it is expected that increased demands on services will result from expanding numbers of older people with LTCs and social care needs. Around 15 million people in England have at least one long-term condition,[1] many have multimorbidity (two or more conditions). Multimorbidity increases the risk of premature death, unplanned hospital admissions and extended length of hospital stay. Individual diseases dominate health-care delivery. The use of many services to manage individual diseases can become duplicative, inefficient and unsafe for patients due to poor communication and integration. Recent DoH initiatives such as the LTC QIPP and the NHS Outcomes Framework[22] are driving changes in healthcare delivery for patients with LTCs. NHS Improving Quality (NHS IQ), hosted by NHS England has developed five improvement programmes based on the NHS Outcomes Framework, their role is to build improvement capacity and capability to help develop knowledge and skills across NHS organisations to support improvements in the five domains. Improving care relies on a cohesive plan of care, good communication amongst health and social care professionals involved in the patient's care and prompt response times. An integrated electronic assessment tool may provide a more efficient method for assessing and planning care across integrated teams. The GM-ELIAT is designed to provide more time-efficient, patient orientated processes to identify and address unmet needs with the potential to reduce unplanned hospital admissions, enhance patients' experience of health and social care and improve quality of life.

Aim

To test the functionality and feasibility of an electronic LTCs integrated assessment tool designed to identify and address LTC needs more effectively that the current paper-based assessment forms used across the Trafford Community Matron (CM) service.

Objectives

- To ensure that the GM-ELIAT is compatible with existing IT systems.
- To establish whether CMs believe that the GM-ELIAT provides a more efficient LTC assessment process than the current assessment process.
- To establish whether CMs believe that the GM-ELIAT provides a more detailed LTC assessment than the current assessment process without the use of clinical experience to add assessment criteria.
- To establish whether CMs believe that the GM-ELIAT provides a more holistic LTC assessment than the current assessment forms in use.
- To establish whether CMs believe that the GM-ELIAT reduces the time spent on LTC assessment process in comparison to the current assessment forms in use.
- To establish whether CMs believe that the GM-ELIAT enhances the quality of LTC assessments in comparison to the current assessment forms in use.
- To establish whether CMs believe that the GM-ELIAT can assist in guiding practice for less experienced healthcare professionals.
- To establish whether CMs believe that the GM-ELIAT can assist in identifying educational needs for less experienced healthcare professionals.

Tool Development

A nine-month prototype tool development phase ensued. The earliest model was a paper based form which was based on a range of available paper-based LTC assessment forms, such as the Single Assessment Process and the Common Assessment Framework. Through further investigation it was felt that there were many holistic LTC paper-based assessment forms available. What was needed was something innovative; that would be an improvement on current assessment processes, therefore, an electronic version was developed. The first draft presented the form on one sheet; each section was divided into symptoms and then subdivided to provide more detail. The tool contained very simple formatting. As development progressed, sections were reorganised into complete body systems and began to look like the current model.

Tool Design

The current GM-ELIAT provides a needs-based assessment that begins with the generic pages: Demographics, Assessment Details, Medical history and Support Services then follows with an assessment of the patient's health and social care needs across the following domains: Physical, Psychological, Social and Spiritual needs. The Physical needs section is by far the largest and is subdivided into systems, such as

cardiovascular, respiratory, neurological and musculoskeletal. There is a page devoted to activities of daily living which is based on an occupational therapy assessment. Pages are also allocated to social needs, advanced care planning and adherence to therapy. Information about the patient's key healthcare professional (HCP), which sections of the tool have been completed and by whom provides an audit trail of the process. A correspondence page can be used for HCPs to communicate with each other. Patient's own health and social needs are recorded as well as personal goals. Throughout the tool comments appear as cells are highlighted to guide practice according to clinical evidence. References to clinical evidence are provided and links to national and international guidelines or clinical tools used within the assessment tool appear at the bottom of each page allowing the assessor to find clinical evidence quickly, when required. Clinical risks are calculated within the tool by demographic data inputted and the scores from embedded health assessment questionnaires and are based on national and international guidelines such as NICE. Risk assessments assist in identifying emerging comorbidity, define the level of care required to reduce risks and avoid preventable deterioration of health and wellbeing. Data inputted culminates in a summary page. Findings from individual sections are brought together to provide an overall picture of the patient's symptoms, clinical examination findings, pathology/other investigations, needs and risks to health and social wellbeing to allow a care plan to be formulated.

Project Design

This pilot project involved recruiting community matrons (CMs) across Greater Manchester to test the functionality and feasibility of the electronic assessment tool. Project set-up meetings were held with senior service leads to generate interest in being involved in the project. A full demonstration of the tool was given with a discussion regarding the evaluation process. The CMs that were recruited to the project were supported throughout by the project lead and the data analyst attached to the project. Facilitation sessions consisted of short meetings to feedback any particular comments about, or issues relating to the tool or process. Meetings were arranged on an individual basis or in groups to suit CMs time schedules. The evaluation involved a number of data collection methods completed via face-to-face interview, or electronically and returned by email. Evaluation questionnaires included baseline, test sequences 1-3 and a final evaluation. Completed LTC assessments with the GM-ELIAT were also part of the evaluation process; these were emailed to the project lead once identifiable information was removed, for analysis and refinement of the tool. Data analysis was conducted by the project lead prior to presentation of findings. Refinement following testing took place after each test, according to the results and prior to the next sequence, the refinement process was determined by the outcomes of each test.

Evaluation Results

The Trafford Community Matron Service was recruited to test the GM-ELIAT, seven community matrons commenced the project in June 2013 and completed baseline evaluations and initial sequence 1 testing; which involved transferring assessment information from their existing assessment tool; the Trafford Single Assessment Process (SAP) to the GM-ELIAT to test whether all the information that was required could be

recorded appropriately and to compare summary outcomes. Unfortunately, shortly after recruitment, CMs were forced to postpone the pilot for four months due to urgent priorities within their service. On restarting, the project, five matrons remained.

Overall results were very positive. Compared to the Trafford SAP, CMs found the GM-ELIAT to be superior to the Trafford SAP for a range of items including time efficiency, providing quality assessment and its educational content. CMs found that the GM-ELIAT delivered a more efficient and detailed assessment process and a more holistic assessment. Automated functions, including calculations and interpretations were found to enhance the quality of assessment and speed the process. Due to an exceptionally small sample, findings should be viewed as being tentative; test results must be interpreted with caution.

Conclusions

This pilot project has provided a useful opportunity for an initial test of the functionality and feasibility of the GM-ELIAT. We were able to get a glimpse of the tool's acceptability across a clinical service. We have worked closely with the CMs throughout the process incorporating their views and their existing practices into the tool development to ensure that the GM-ELIAT is fit for purpose and accepted within a community matron service. The GM-ELIAT is totally different in many ways to the Trafford SAP, yet is contains all the elements of the Trafford SAP and more, to provide a comprehensive assessment process; this is possibly one of the reasons that the GM-ELIAT has received such a positive evaluation from the Trafford CMs. Although the numbers involved in testing the tool have been extremely small, all CMs were very experienced advanced nurse practitioners with a breadth of knowledge of LTCs; their feedback has been invaluable in taking this project forward. The pilot has also proved useful in testing the evaluation process and data collection methods. Reflections about the process and methods used will be synthesised prior to planning future projects.

1. Introduction

This pilot project was designed to test the functionality and feasibility of a prototype Electronic Long-term Conditions (LTCs) Integrated Assessment Tool (GM-ELIAT) within a community matron service. The GM-ELIAT provides an integrated, individualised holistic assessment involving physical, psychological, social and spiritual needs for patients either referred to a community service, such as a community matron team or for patients referred to an integrated team as a result of risk stratification, according to health and social care need, in line with the LTC QIPP[3]. The GM-ELIAT has been designed to identify and address unmet needs, identify co-morbid risk, reduce time spent on the assessment process in comparison to paper based forms, enhance the quality of assessment and referral by the use of a range of risk assessment tools and electronic documentation and standardise the assessment process for patients with multimorbidity, across integrated health and social care teams. For ease of development, modification and for initial functionality and feasibility testing, the prototype tool has been built in excel and does not currently have sharing capabilities, this is dependent on NHS clinical system technology to have sufficient networking capacity. In parallel to development of the GM-ELIAT the capabilities of existing clinical information systems to share assessment information across services has been, and will continue to be explored to assess the feasibility of integrating the tool into current systems. This report, however, will focus on the feasibility of the tool in its current format and not the exploration of integrating the tool into clinical systems.

2. Background

LTCs such as cardiovascular disease (CVD), diabetes and respiratory disease are the leading cause of disability and death in the western world.[1] Due to an aging population it is expected that increased demands on services will result from expanding numbers of older people with LTCs and social care needs.[4] Around 15 million people in England have at least one long-term condition,[1] many have multimorbidity (two or more conditions).[5] Multimorbidity increases the risk of premature death,[6 7] unplanned hospital admissions[8] and extended length of (hospital) stay (LOS).[9] Patients with multimorbidity are generally higher uses of health services,[8 10] are more likely to have poorer quality of life, loss of physical functioning and suffer from

depression.[11-16] The consequences of multimorbidity can lead to poor adherence to therapy[17-22] which can result in further morbidity and increased resource utilisation owing to treatment failure.[23]

Individual diseases dominate health-care delivery, yet people with multimorbidity need a much broader approach.[24] The use of many services to manage individual diseases can become duplicative, inefficient and unsafe for patients due to poor communication and integration.[8 25] To identify the risks associated with multiple LTCs, a more effective and better understanding of the epidemiology and impact of multimorbidity is needed to inform the way in which health care is organised and delivered.[10] Recent DoH initiatives are driving changes in healthcare delivery for patients with LTCs. The LTC QIPP workstream focuses on improving the quality and productivity of services for patients and carers to enable better access to higher quality, local, comprehensive community and primary care. The workstream seeks to reduce unscheduled hospital admissions by 20%, reduce LOS by 25% and maximise the number of people controlling their own health through the use of supported care planning.[3] The NHS Outcomes Framework[2] sets out national outcome goals which define indicators for improvement across five domains:

- Preventing people from dying prematurely
- Enhancing quality of life for people with long term conditions
- Ensuring the people have a positive experience of care
- Helping people to recover from episodes of ill health or following injury
- Treating and caring for people in a safe environment and protecting them from avoidable harm

The Commissioning Outcomes Framework[26] is driving local improvements by translating the NHS Outcomes Framework into outcomes and indicators that are meaningful at a local level. Clinical Commissioning Groups (CCGs) will be held accountable for their progress in delivering these outcomes.

Indicators are spread across the five domains and include: reducing the under 75 mortality rate, improving functional ability, ensuring people feel supported to manage their condition(s), reducing unplanned admissions, improving access to primary care services and reducing the incidence of medications errors. NHS Improving Quality (NHS IQ),[27] hosted by NHS England has developed five improvement programmes based on the NHS Outcomes Framework, their role is to build improvement capacity and capability to help

develop knowledge and skills across NHS organisations to support improvements in the five domains. Improving care relies on a cohesive plan of care, good communication amongst health and social care professionals involved in the patient's care and prompt response times. An integrated electronic assessment tool may provide a more efficient method for assessing and planning care across integrated teams. The GM-ELIAT is designed to provide more time-efficient, patient orientated processes to identify and address unmet needs with the potential to reduce unplanned hospital admissions, enhance patients' experience of health and social care and improve quality of life.

This project builds on the work previously carried out by GM-CLAHRC in seeking to identify patients in early stages of CVD, improving patients and HCPs' awareness of the risks associated with diseases such as CKD, HF and diabetes, addressing individual needs associated with debilitating diseases such as stroke and improving self-monitoring skills for patients with hypertension and pre-diabetes. The roles and responsibilities of those involved in the project are described in Table 1

Table 1: Roles and responsibilities

Name and Role	***Responsibilities***
Trish Gray: Research Fellow	**Tool Development and Refinement** Design and development of the GM-ELIAT Monitoring of development progress Refinement planning and monitoring **Evaluation Project** Project design Preparation of project brief Day to day project management Design and development of data collection tools **Recruitment** Initial contact with community service leads across Greater Manchester Initial contact with community matrons in Trafford, Central and North Manchester and Bury Project set-up meetings **Facilitation** Individual and Group facilitation Data collection **Evaluation Report** Data extraction and preparation Data analysis Preparation of report **Future Planning** Developing and maintaining links with clinical systems companies Developing links with organisations to take project forward Intellectual Property
Caroline O'Donnell Analyst	**Template Development and Refinement** Development and refinement Preparation of electronic data collection tools Data extraction **Facilitation** Individual and Group facilitation Data Collection
Astrid Born Project Support Officer	**Evaluation Report** Support to project lead

3. Aim

To test the functionality and feasibility of an electronic LTCs integrated assessment tool designed to identify and address LTC needs more effectively that the current paper-based assessment forms across the Trafford Community Matron (CM) service.

4. Objectives

- To ensure that the GM-ELIAT is compatible with existing IT systems
- To establish whether CMs believe that the GM-ELIAT provides a more efficient LTC assessment process than the current assessment process.
- To establish whether CMs believe that the GM-ELIAT provides a more detailed LTC assessment than the current assessment process without the use of clinical experience to add assessment criteria.
- To establish whether CMs believe that the GM-ELIAT provides a more holistic LTC assessment than the current assessment forms in use.
- To establish whether CMs believe that the GM-ELIAT reduces the time spent on LTC assessment process in comparison to the current assessment forms in use.
- To establish whether CMs believe that the GM-ELIAT enhances the quality of LTC assessments in comparison to the current assessment forms in use.
- To establish whether CMs believe that the GM-ELIAT can assist in guiding practice for less experienced healthcare professionals.
- To establish whether CMs believe that the GM-ELIAT can assist in identifying educational needs for less experienced healthcare professionals.

5. Scoping

Development of the tool began with a number of scoping activities as follows:

- A literature review of evidence relating to the health and social care needs of patients with multimorbidity.
- Patient interviews: patients were recruited to participate in face-to-face or telephone interviews via secondary or primary care clinics including a patient support group, a hospital cardiology clinic and a community integrated care centre to gain greater understanding of their needs and experiences of primary and community care services. Data were collected via semi-structured schedules prior to quantitative analysis. Questions sought to find out how patients managed their long-term conditions, what support they received from health and social care professionals and whether the support adequately helped them to manage their conditions effectively.
- Informal discussions took place with health and social care professionals regarding the development, format and content of the assessment tool. Discussions took place with secondary and community specialists (medical and nursing), Allied Health Professionals (AHPs) and social care professionals regarding the specific format, clinical questionnaires and the clinical guidance to be embedded in the tool.
- Discussions took place with IT personnel within the GM CLAHRC systems team and with NHS IT Teams and clinical software companies regarding the compatibility of a computerised assessment tool with existing clinical systems.
- The project lead attended a number of integrated care meetings such as the Salford Integrated Care Programme for Older People, networked at a number of integrated care seminars and conferences and met individually with healthcare professionals (HCPs) who were leading or involved in setting up integrated teams across health and social care services on the UK.

Scoping found that whilst a number of patients had a very good relationship with the healthcare professionals they were in contact with and felt that they were given time to discuss any problems or worries they had about their health, a large proportion, however, felt that there was a lack of continuity regarding their healthcare. Patients reported that they saw a number of different professionals and had to repeat the same information several times, they were given conflicting advice from their GP and hospital clinicians for the same condition.

Patients attended their GP practice on several occasions for different LTC reviews; appointments were allocated only to one LTC at a time. They also attended a number of specialist clinics; each dealing with a different aspect of their healthcare. Many patients felt that there was limited time at GP, community or hospital appointments to raise concerns that were not directly related to the problem being assessed or reviewed even though their concern may impact on that condition. Patients frequently said that doctors were very busy and they didn't feel they should disrupt clinic schedules by discussing their problems.

In community services, a variety of paper-based forms are used to conduct LTC assessments for patients with multimorbidity. New patient assessments are more detailed than in primary care but they vary in detail across services. There is much repetition within and between services and a lot of time spent writing by hand in front of the patient. HCPs conducting assessments must work in a very methodical way to ensure nothing is missed during the assessment and must rely heavily on their knowledge, experience and skills to obtain an accurate and effective assessment that clearly identifies patients' LTC needs and delivers an individualised care plan to specifically address those needs.

Healthcare is changing. We are witnessing a shift in management of patients with LTCs from secondary to primary care. In Greater Manchester, a review of health and social care is underway by Healthier Together to champion this shift.[28] Through risk stratification, integrated health and social care teams are developing strategies to reduce unplanned hospital admission and healthcare burden.[3] New methods to manage people with LTCs are being sought; such as streamlining care, improving communication amongst service providers and providing greater local access. Improving Information Management and Technology (IM&T) is crucial to delivering a shared care approach; it is an opportune time to develop innovative methods to improve healthcare delivery.

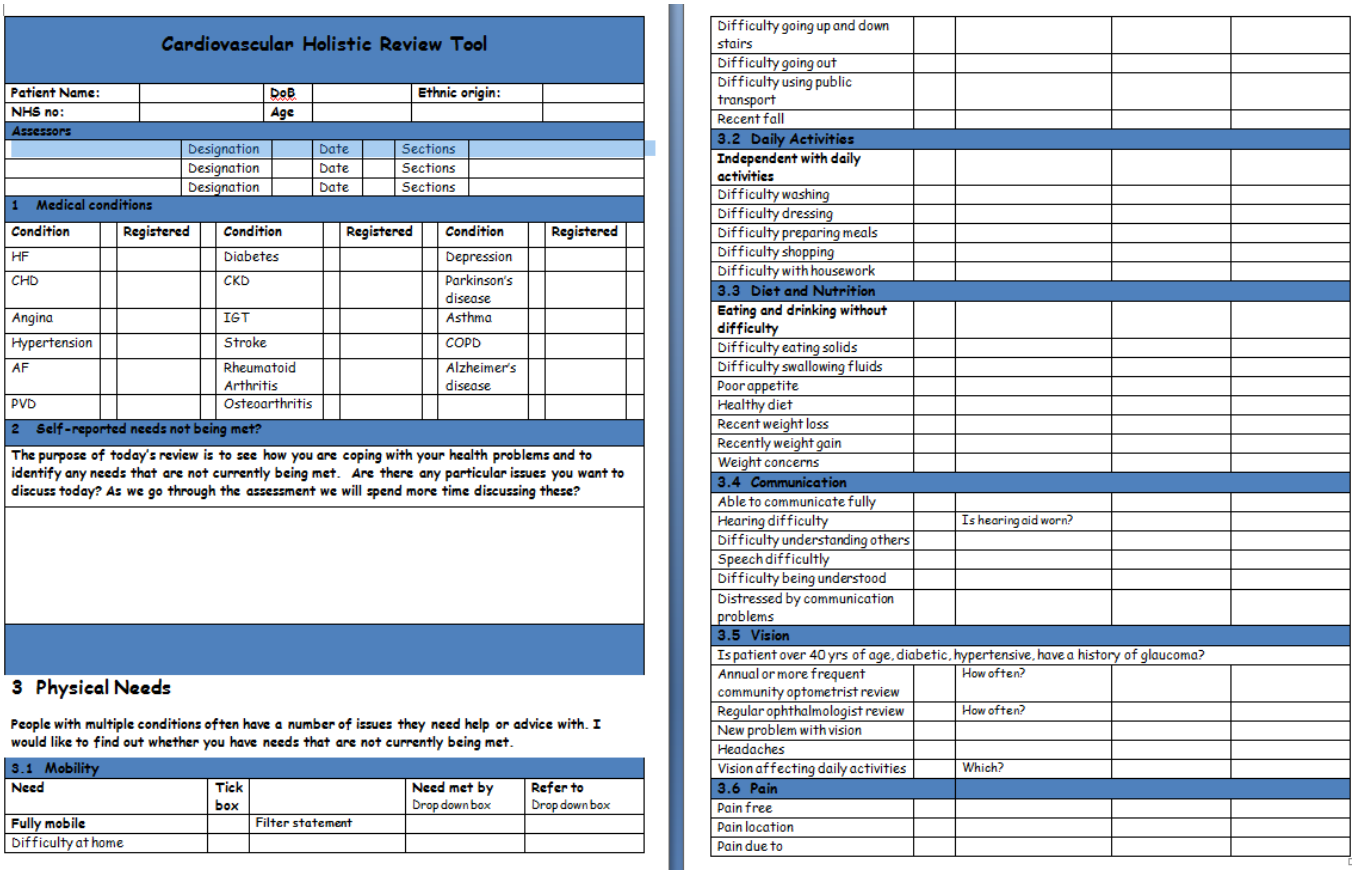
The initial remit of this project was to develop a single assessment tool for use across primary and community care for patients with CVD, however, the results of the scoping exercise provided evidence that it would not be feasible to have one tool to suit both primary and community needs. The tool began as a CVD tool, but as development progressed, and the project was informed by the HCPs that would potentially use it, it became apparent that keeping it as a tool to manage patients with CVD only, would suppress the value of it being used

to manage people with multimorbidity, assigned to integrated health and social care teams. The scoping phase proved to be valuable for tool development and created a renewed focus to meet the needs of patients with multimorbidity within the different settings; hence the creation of two separate tools; one for use by primary care teams, to improve the LTC review process for patients with multimorbidity (GM-ELIRT, described in a separate report) and the other for integrated community teams, to improve the assessment process for patients with multimorbidity (GM-ELIAT, as described in this pilot evaluation report).

6. Tool Development

A nine-month prototype tool development phase ensued. There is strong support amongst HCPs for compatibility between electronic systems across services to enable patient information to be shared between primary, secondary and community services. The latter occurs to a limited extent in some locations, for example, the SRFT integrated electronic patient record (EPR) can extract primary care data, however, Salford GPs have read-only access and cannot upload primary care patient details onto the record at present. There are plans to broaden the system to GP practices and extend access to some community services, but this may take some time. At this stage, an electronic assessment tool would be a valuable addition to the system. Initial discussions are underway to take the project forward in Salford once feasibility has been confirmed. The prototype tool has been designed and refined in excel 2010 by the project lead and GM-CLAHRC's data analysts. Excel was deemed the most flexible application to easily modify the assessment on a regular basis and to allow for the functionality required. The prototype cannot be linked to a clinical system, however, as the capability to share information is an integral part of integrated care, investigation into the compatibility of the tool with available EPR systems is on-going as part of a wider project. For the purposes of this pilot, however, progress regarding this aspect will not be described in detail. The development process involved an intense search for clinical evidence to support all decisions made regarding included content and a series of meetings and discussions with specialist clinicians; secondary care consultants, GPs with special interest in LTCs, specialist, advanced practice and consultant nurses. The format has changed considerably as work has progressed. The earliest model that began during scoping was a paper based form as presented in the

sample pages in Figure 1. This was based on a range of available paper-based LTC assessment forms such as the Single Assessment Process [29] and the Common Assessment Framework[30]



Cardiovascular Holistic Review Tool

Patient Name:		DoB		Ethnic origin:	
NHS no:		Age			

Assessors

	Designation		Date		Sections	
	Designation		Date		Sections	
	Designation		Date		Sections	

1 Medical conditions

Condition	Registered	Condition	Registered	Condition	Registered
HF		Diabetes		Depression	
CHD		CKD		Parkinson's disease	
Angina		IGT		Asthma	
Hypertension		Stroke		COPD	
AF		Rheumatoid Arthritis		Alzheimer's disease	
PVD		Osteoarthritis			

2 Self-reported needs not being met?

The purpose of today's review is to see how you are coping with your health problems and to identify any needs that are not currently being met. Are there any particular issues you want to discuss today? As we go through the assessment we will spend more time discussing these?

3 Physical Needs

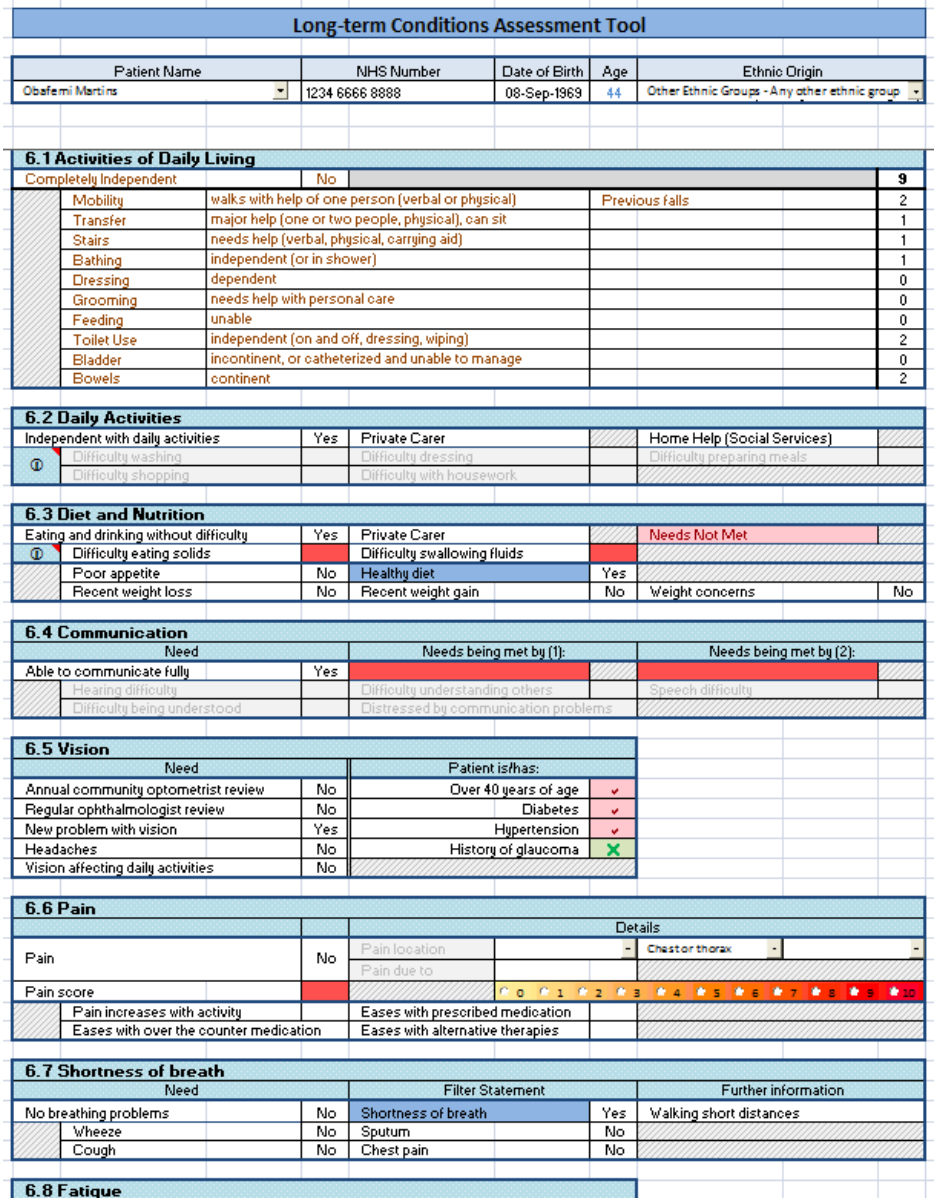
People with multiple conditions often have a number of issues they need help or advice with. I would like to find out whether you have needs that are not currently being met.

3.1 Mobility

Need	Tick box		Need met by Drop down box	Refer to Drop down box
Fully mobile		Filter statement		
Difficulty at home				
Difficulty going up and down stairs				
Difficulty going out				
Difficulty using public transport				
Recent fall				
3.2 Daily Activities				
Independent with daily activities				
Difficulty washing				
Difficulty dressing				
Difficulty preparing meals				
Difficulty shopping				
Difficulty with housework				
3.3 Diet and Nutrition				
Eating and drinking without difficulty				
Difficulty eating solids				
Difficulty swallowing fluids				
Poor appetite				
Healthy diet				
Recent weight loss				
Recently weight gain				
Weight concerns				
3.4 Communication				
Able to communicate fully				
Hearing difficulty		Is hearing aid worn?		
Difficulty understanding others				
Speech difficultly				
Difficulty being understood				
Distressed by communication problems				
3.5 Vision				
Is patient over 40 yrs of age, diabetic, hypertensive, have a history of glaucoma?				
Annual or more frequent community optometrist review		How often?		
Regular ophthalmologist review		How often?		
New problem with vision				
Headaches				
Vision affecting daily activities		Which?		
3.6 Pain				
Pain free				
Pain location				
Pain due to				

Figure 1: GM-ELIAT previously GM-CHRT First Draft Paper Form.

Through further investigation it was felt that there were many holistic LTC paper-based assessment forms available. What was needed was something innovative; that would be an improvement on current assessment processes. An electronic version was, therefore, developed. The first draft of the electronic version presented the form on one sheet; the user would scroll down to complete each section. Each section was divided into symptoms and then subdivided to provide more detail but sections lacked detail (Figure 2). The tool contained very simple formatting.



Long-term Conditions Assessment Tool

Patient Name	NHS Number	Date of Birth	Age	Ethnic Origin
Obafemi Martins	1234 6666 8888	08-Sep-1969	44	Other Ethnic Groups - Any other ethnic group

6.1 Activities of Daily Living

Completely Independent	No			9
Mobility	walks with help of one person (verbal or physical)	Previous falls		2
Transfer	major help (one or two people, physical), can sit			1
Stairs	needs help (verbal, physical, carrying aid)			1
Bathing	independent (or in shower)			1
Dressing	dependent			0
Grooming	needs help with personal care			0
Feeding	unable			0
Toilet Use	independent (on and off, dressing, wiping)			2
Bladder	incontinent, or catheterized and unable to manage			0
Bowels	continent			2

6.2 Daily Activities

Independent with daily activities	Yes	Private Carer		Home Help (Social Services)	
Difficulty washing		Difficulty dressing		Difficulty preparing meals	
Difficulty shopping		Difficulty with housework			

6.3 Diet and Nutrition

Eating and drinking without difficulty	Yes	Private Carer		Needs Not Met	
Difficulty eating solids		Difficulty swallowing fluids			
Poor appetite	No	Healthy diet	Yes		
Recent weight loss	No	Recent weight gain	No	Weight concerns	No

6.4 Communication

Need		Needs being met by (1):		Needs being met by (2):	
Able to communicate fully	Yes				
Hearing difficulty		Difficulty understanding others		Speech difficulty	
Difficulty being understood		Distressed by communication problems			

6.5 Vision

Need		Patient is/has:	
Annual community optometrist review	No	Over 40 years of age	✓
Regular ophthalmologist review	No	Diabetes	✓
New problem with vision	Yes	Hypertension	✓
Headaches	No	History of glaucoma	✗
Vision affecting daily activities	No		

6.6 Pain

		Details			
Pain	No	Pain location		Chest or thorax	
		Pain due to			
Pain score		0 1 2 3 4 5 6 7 8 9 10			
Pain increases with activity		Eases with prescribed medication			
Eases with over the counter medication		Eases with alternative therapies			

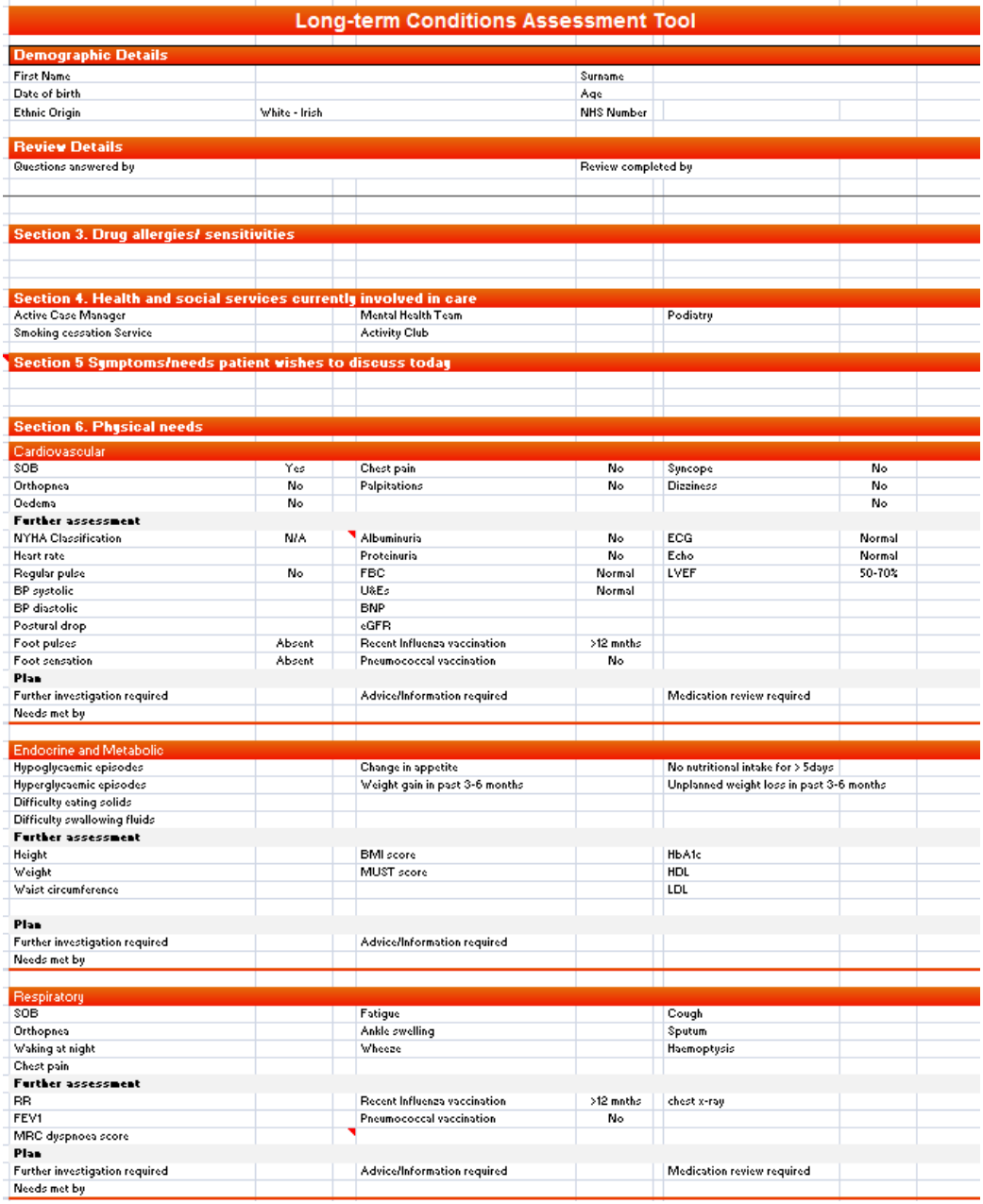
6.7 Shortness of breath

Need		Filter Statement		Further information
No breathing problems	No	Shortness of breath	Yes	Walking short distances
Wheeze	No	Sputum	No	
Cough	No	Chest pain	No	

6.8 Fatigue

Figure 2: Early Draft Electronic v2.

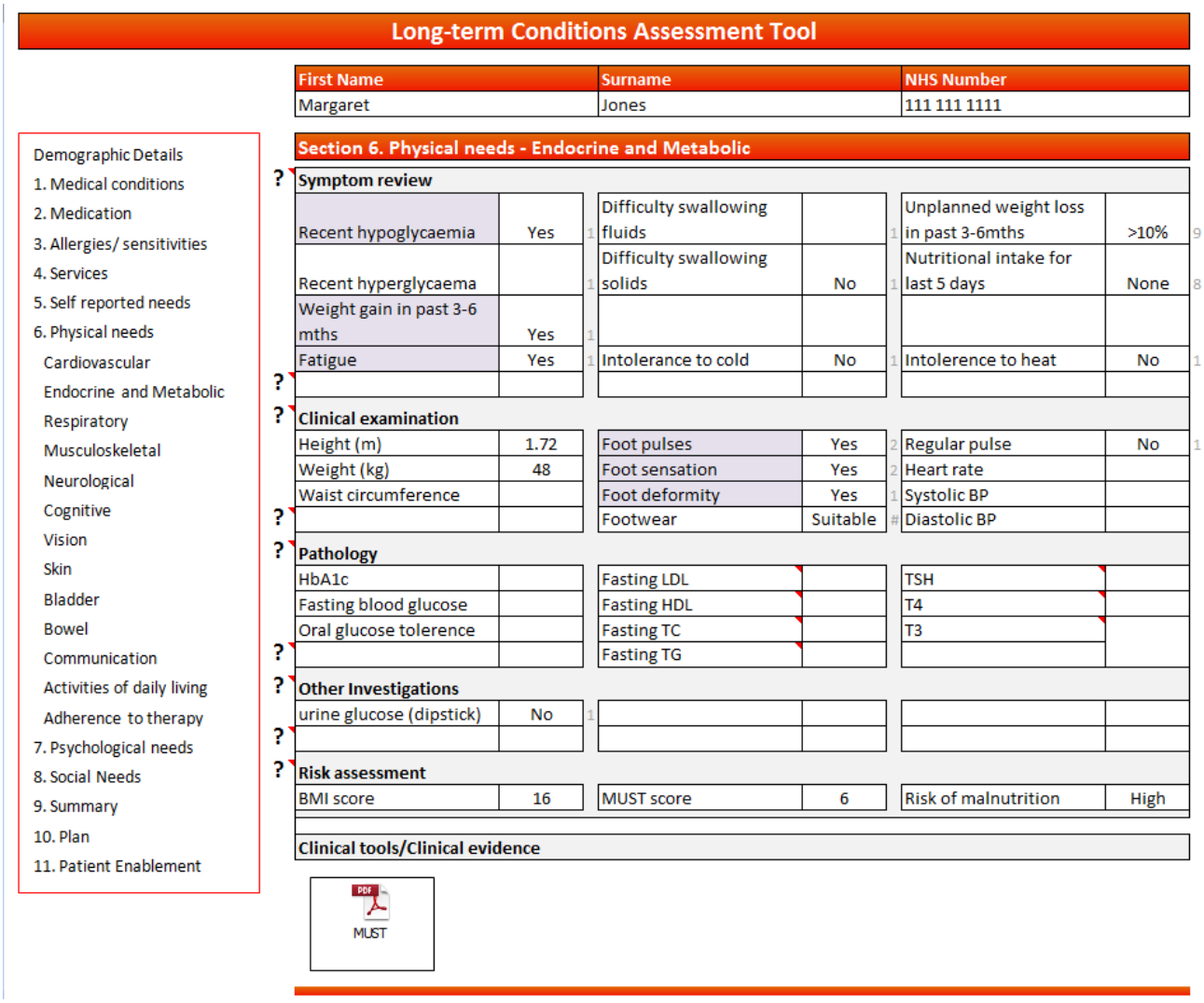
As development progressed, sections were reorganised into complete body systems e.g. respiratory, musculoskeletal and neurological, as shown in Figure 2. The symptoms listed were increased and the sections extended to include further assessment which encompassed clinical examination, investigations such as radiological and pathology tests required and a plan of care within each section as shown in Figure 3.



Long-term Conditions Assessment Tool					
Demographic Details					
First Name			Surname		
Date of birth			Age		
Ethnic Origin	White - Irish		NHS Number		
Review Details					
Questions answered by			Review completed by		
Section 3. Drug allergies/ sensitivities					
Section 4. Health and social services currently involved in care					
Active Case Manager		Mental Health Team		Podiatry	
Smoking cessation Service		Activity Club			
Section 5 Symptoms/needs patient wishes to discuss today					
Section 6. Physical needs					
Cardiovascular					
SOB	Yes	Chest pain	No	Syncope	No
Orthopnea	No	Palpitations	No	Dizziness	No
Oedema	No				No
Further assessment					
NYHA Classification	N/A	Albuminuria	No	ECG	Normal
Heart rate		Proteinuria	No	Echo	Normal
Regular pulse	No	FBC	Normal	LVEF	50-70%
BP systolic		U&Es	Normal		
BP diastolic		BNP			
Postural drop		eGFR			
Foot pulses	Absent	Recent Influenza vaccination	>12 mnths		
Foot sensation	Absent	Pneumococcal vaccination	No		
Plan					
Further investigation required		Advice/Information required		Medication review required	
Needs met by					
Endocrine and Metabolic					
Hypoglycaemic episodes		Change in appetite		No nutritional intake for > 5days	
Hyperglycaemic episodes		Weight gain in past 3-6 months		Unplanned weight loss in past 3-6 months	
Difficulty eating solids					
Difficulty swallowing fluids					
Further assessment					
Height		BMI score		HbA1c	
Weight		MUST score		HDL	
Waist circumference				LDL	
Plan					
Further investigation required		Advice/Information required			
Needs met by					
Respiratory					
SOB		Fatigue		Cough	
Orthopnea		Ankle swelling		Sputum	
Waking at night		Wheeze		Haemoptysis	
Chest pain					
Further assessment					
RR		Recent Influenza vaccination	>12 mnths	chest x-ray	
FEV1		Pneumococcal vaccination	No		
MRC dyspnoea score					
Plan					
Further investigation required		Advice/Information required		Medication review required	
Needs met by					

Figure 3: Early draft v4 pre GM-ELIAT

Through further detailed discussions with community matrons in Trafford, Central and North Manchester, Care Co-ordinators in Bury and a detailed review of LTC assessment forms used in community services across Greater Manchester, the tool began to look like the current model. Body systems were presented on separate sheets with the facility to populate across pages for symptoms that overlapped. A risk assessment section was added to each sheet to assist in identifying health risks, so that an individualised care could be developed. A quick link tool bar was added to assist the user to click back and forward as required (Figure 4).



Long-term Conditions Assessment Tool

First Name	Surname	NHS Number
Margaret	Jones	111 111 1111

Demographic Details
1. Medical conditions
2. Medication
3. Allergies/ sensitivities
4. Services
5. Self reported needs
6. Physical needs
Cardiovascular
Endocrine and Metabolic
Respiratory
Musculoskeletal
Neurological
Cognitive
Vision
Skin
Bladder
Bowel
Communication
Activities of daily living
Adherence to therapy
7. Psychological needs
8. Social Needs
9. Summary
10. Plan
11. Patient Enablement

Section 6. Physical needs - Endocrine and Metabolic

Symptom review

Recent hypoglycaemia	Yes	Difficulty swallowing fluids		Unplanned weight loss in past 3-6mths	>10%
Recent hyperglycaema		Difficulty swallowing solids	No	Nutritional intake for last 5 days	None
Weight gain in past 3-6 mths	Yes				
Fatigue	Yes	Intolerance to cold	No	Intolerence to heat	No

Clinical examination

Height (m)	1.72	Foot pulses	Yes	Regular pulse	No
Weight (kg)	48	Foot sensation	Yes	Heart rate	
Waist circumference		Foot deformity	Yes	Systolic BP	
		Footwear	Suitable	Diastolic BP	

Pathology

HbA1c		Fasting LDL		TSH	
Fasting blood glucose		Fasting HDL		T4	
Oral glucose tolerence		Fasting TC		T3	
		Fasting TG			

Other Investigations

urine glucose (dipstick)	No				

Risk assessment

BMI score	16	MUST score	6	Risk of malnutrition	High

Clinical tools/Clinical evidence

MUST

Figure 4: GM-ELIAT v7c.

Through the development process, the project lead met with a variety of HCPs such as a consultant rheumatologist, consultant rheumatology nurse, consultant cardiologist, consultant physiotherapist, community matrons, occupational therapists, a Rehabilitation Lead, CCG clinical leads for LTCs and IM&T. All were given a demonstration of the tool and provided their feedback of items to be added or refined. This format continued its metamorphosis over several months into the model that has been tested during this pilot project. A summary of the development stages are presented in Appendix 1. A more detailed description of the current design will now be given.

7. Tool Design

The current GM-ELIAT provides a needs-based assessment that begins with the generic pages: Demographics, Assessment Details, Medical history, Support Services, prior to an assessment of the patients health and social care needs across the following domains: Physical, Psychological, Social and Spiritual. The Physical needs section is by far the largest and is subdivided into the following areas:

- Cardiovascular
- Endocrine and Metabolic
- Respiratory
- Musculoskeletal
- Neurological
- Cognitive
- Sensory
- Activities of Daily Living (ADL)
- Urological
- Gastrointestinal
- Tissue Viability

Advanced Care Planning (ACP) follows Physical Needs but is yet to be developed. Psychological needs is laid out similarly to Physical needs and includes assessment of anxiety, depression, mood, abnormal behaviour and relationship problems (this section does not investigate mental health issues in depth but this could be developed at a later date). The Social needs page includes; accommodation access, facilities, home safety, finance, education, employment, benefits, power of attorney, emotional support and informal care. The Spiritual needs section is yet to be developed but will include patients' wishes concerning healthcare therapies and where they wish to be cared for according to their religious and spiritual beliefs. There is a page devoted to adherence to therapy, a much researched topic[19 31-33] but not always addressed in clinical practice. Information entered during the assessment process is populated to a summary page to allow a care plan to be formulated. Specific aspects of the tool will now be described in more detail.

7.1. General information

The GM-ELIAT opens on the demographics page as shown in Figure 5. Cells are completed by either choosing the appropriate option from a drop down box or by adding free text. Selected cells are highlighted. Answers are mainly inputted by drop down box options but where more detail is required, free text can be entered into the further details/comments box at the bottom of each page. The cell expands to fit the required text.

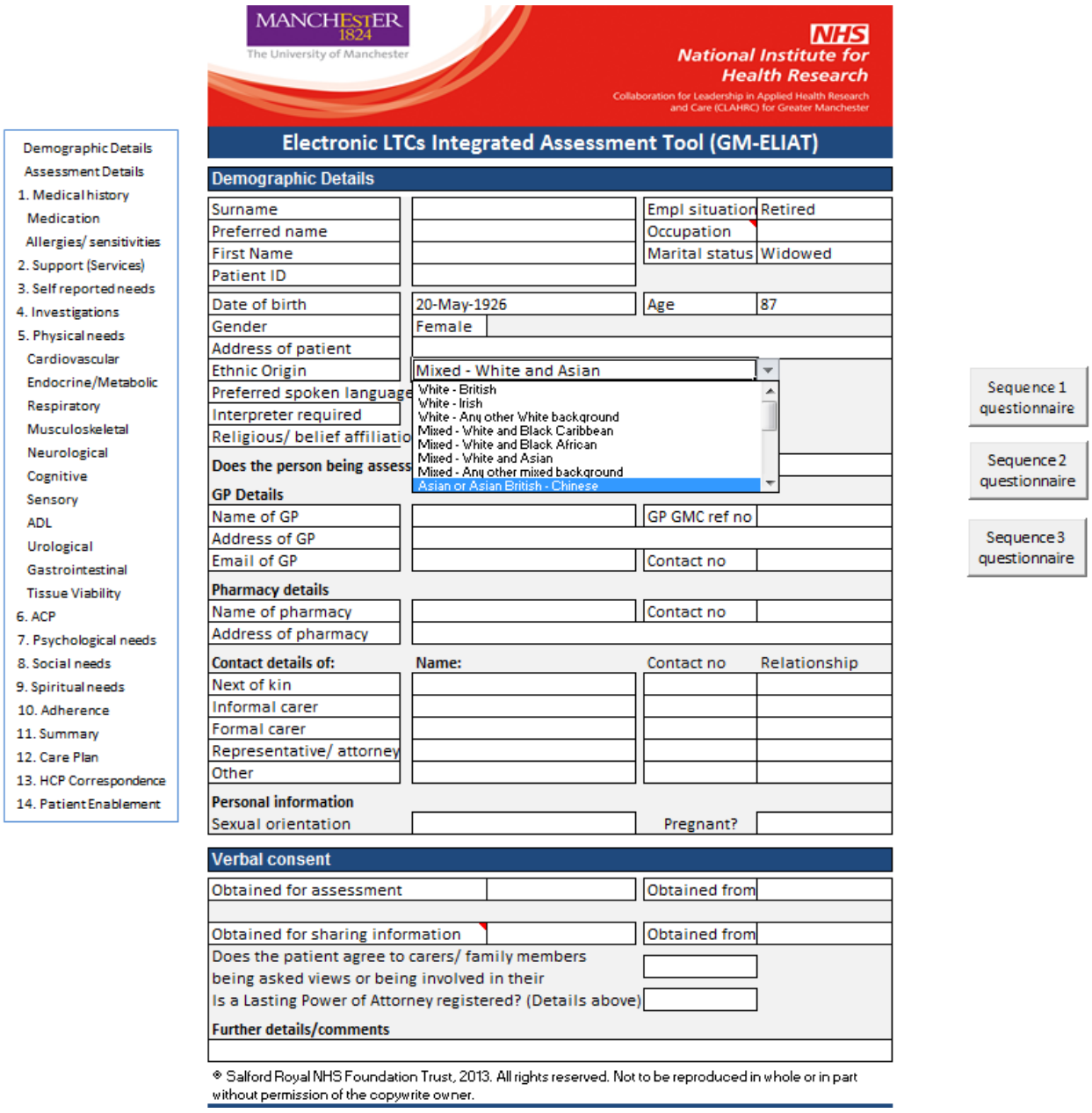


Figure 5: GM-ELIAT Current version: Demographic page

The Assessment Details page (Figure 6) records details that are essential for a shared tool. The HCP responsible for coordinating care is recorded as well as any important information about gaining access to the patient's home to avoid future difficulties. An audit trail of the assessment is provided as each assessor fills in the sections they have competed with the date and time of assessment. Once a date is added, another section is revealed to allow another assessor to complete.

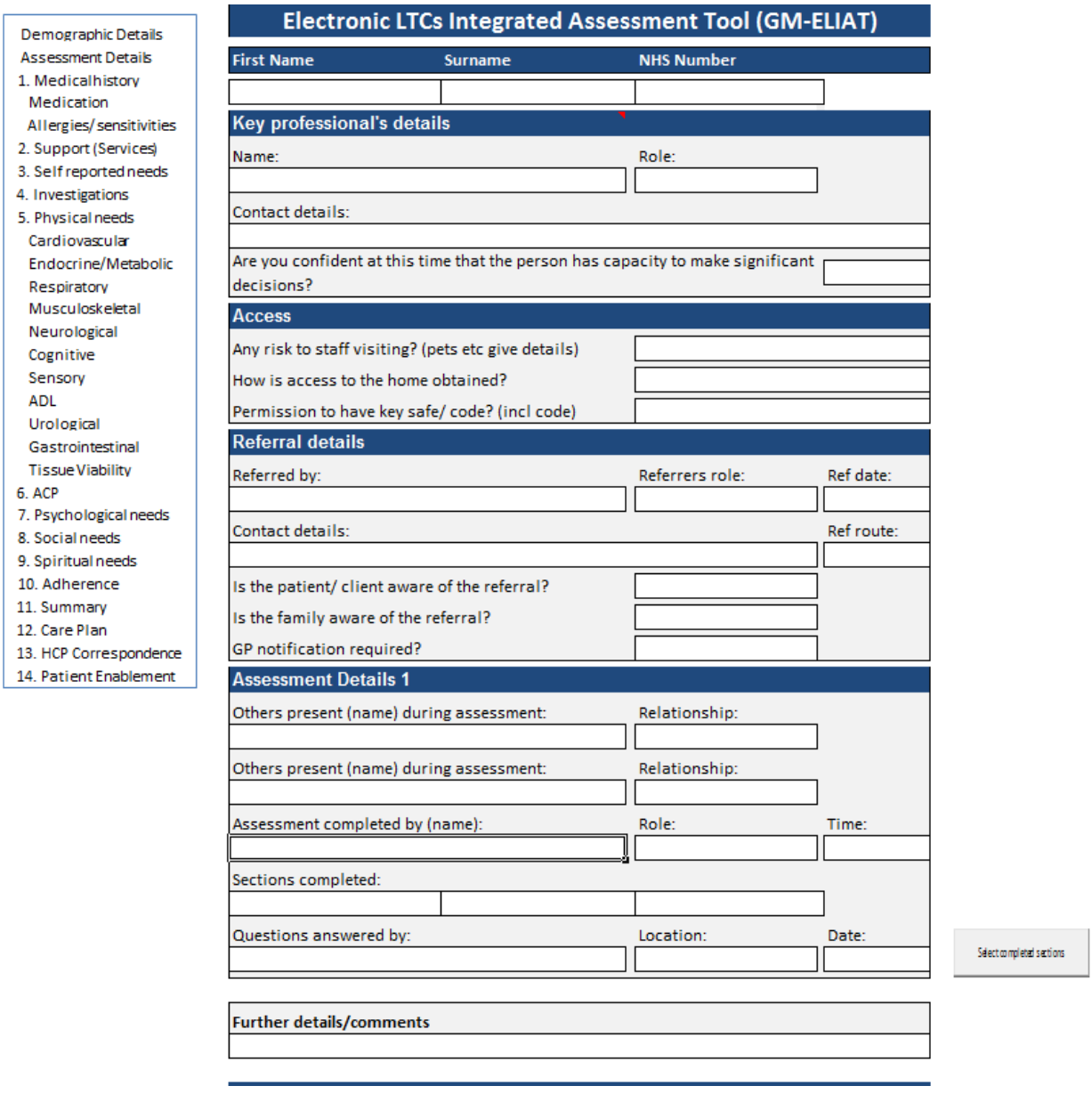


Figure 6: GM-ELIAT Assessment Details page

A correspondence page (Figure 7) can be used by the assessor to refer the patient to other HCPs e.g. a community matron may refer to a social worker to complete the Social needs section or request actions to be

undertaken e.g. a district nurse may refer the patient to an occupational therapist (OT) for bath aids. As previously mentioned, the GM-ELIAT in its present form cannot be used as a shared tool but the potential for developing the tool into a clinical system is being explored.

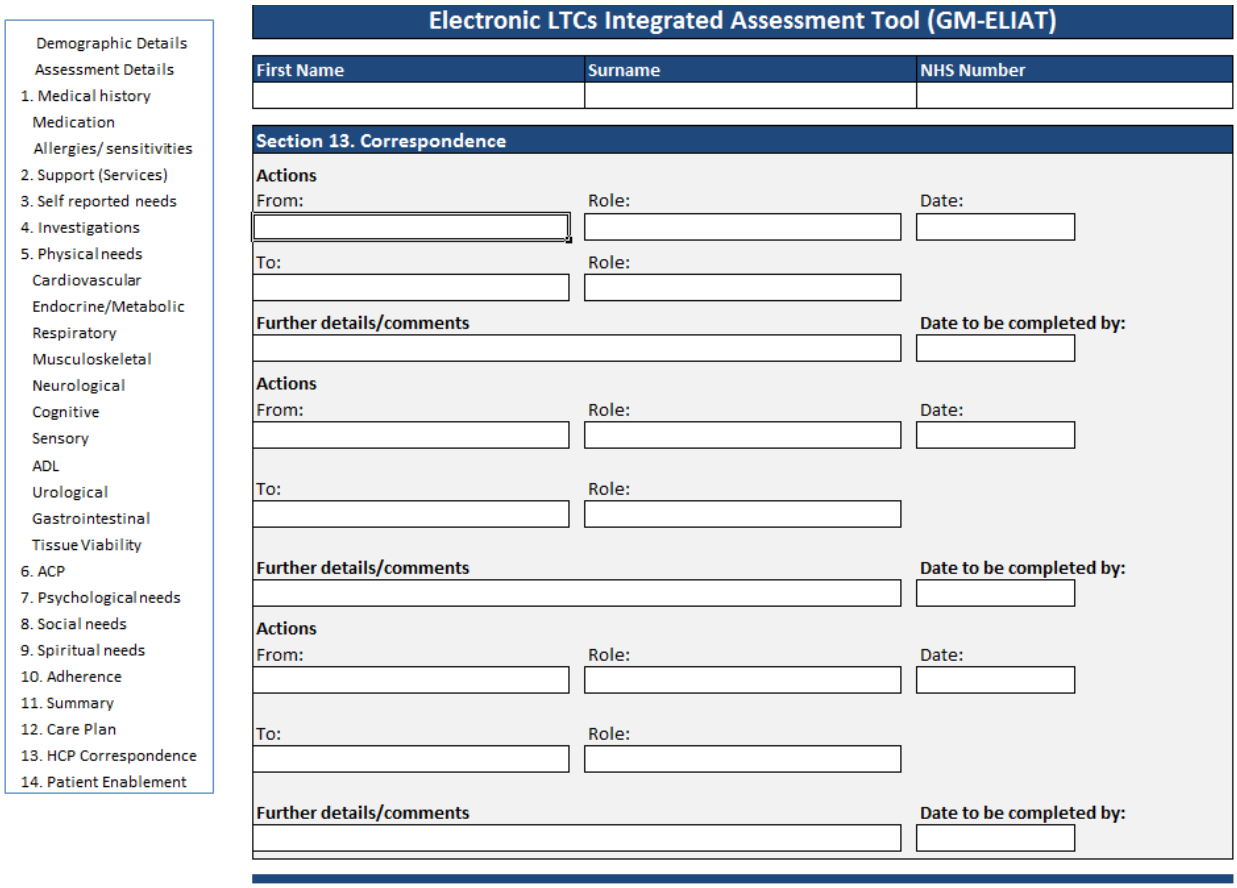


Figure 7: GM-ELIAT Correspondence page

The support page (Figure 8) provides details of the health and social care support that the patient is currently receiving as well as recording details of recent hospital admissions. This will assist the assessor to plan for future services needed or reassess the level of support required by a service currently involved.

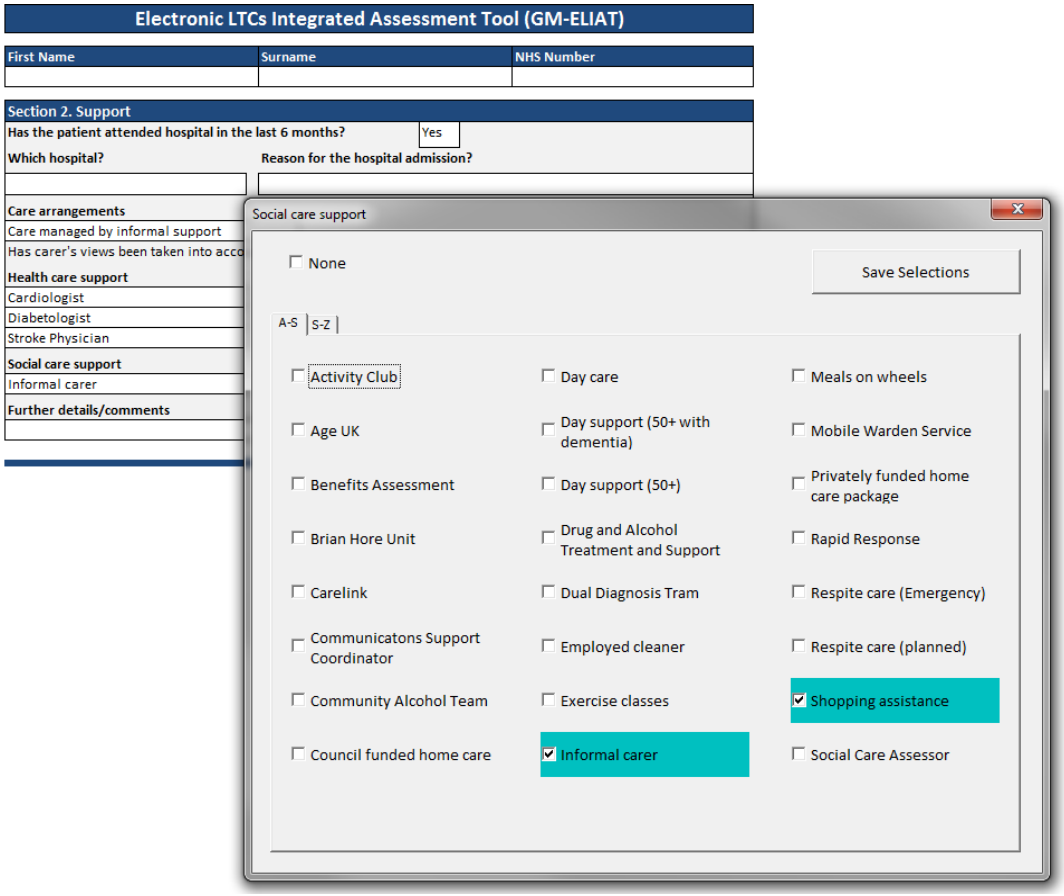
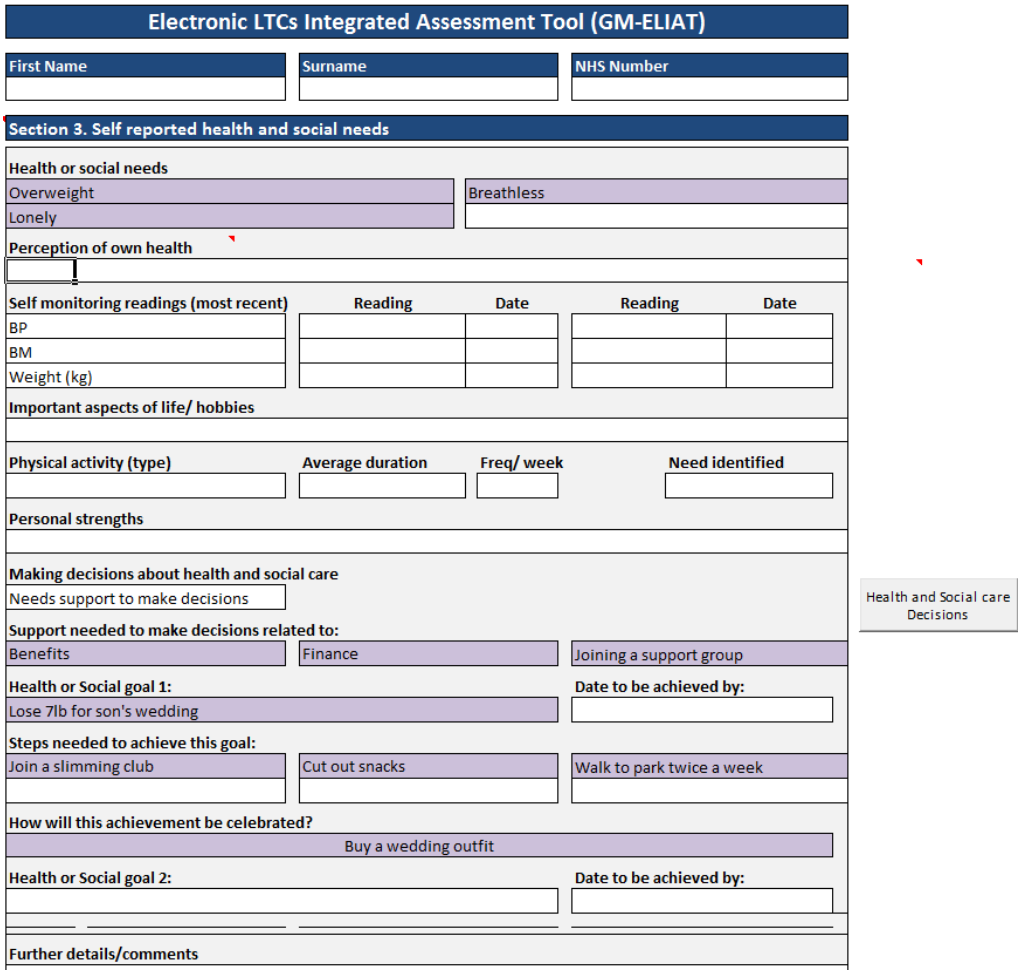


Figure 8: GM-ELIAT Support page

A Self-reported needs page assists in incorporating the patient's wishes and priorities when planning care. Patients are asked if they have goals, when they wish to achieve them by, what they need to do to achieve them and how they will celebrate (Figure 9). The patient or carer could be given or sent a leaflet prior to the assessment to allow them time to think about their health and social needs, their perception of their health, what is important to them and whether they have goals they wish to achieve.



Electronic LTCs Integrated Assessment Tool (GM-ELIAT)

First Name	Surname	NHS Number

Section 3. Self reported health and social needs

Health or social needs

Overweight	Breathless
Lonely	

Perception of own health

Self monitoring readings (most recent)

	Reading	Date	Reading	Date
BP				
BM				
Weight (kg)				

Important aspects of life/ hobbies

Physical activity (type)	Average duration	Freq/ week	Need identified

Personal strengths

Making decisions about health and social care

Needs support to make decisions

Health and Social care Decisions

Support needed to make decisions related to:

Benefits	Finance	Joining a support group

Health or Social goal 1: Lose 7lb for son's wedding — **Date to be achieved by:**

Steps needed to achieve this goal:

Join a slimming club	Cut out snacks	Walk to park twice a week

How will this achievement be celebrated?

Buy a wedding outfit

Health or Social goal 2: — **Date to be achieved by:**

Further details/comments

Figure 9: GM-ELIAT Self reported needs

7.2. Clinical Information

The majority of physical needs pages are laid out in a standard format and include the following headings: symptom review, clinical examination, pathology, other investigations, risk assessment, further details/comments and clinical tools/clinical evidence. Pop-up questionnaire boxes are triggered by clinical information selected, for example, on the cardiovascular page (Figure 10), shortness of breath (SOB) was selected and as heart failure had previously been selected on the medical conditions page, the New York Heart Association (NYHA) Functional Classification[34] questionnaire appears for the assessor to select a classification. Pop-up clinical advice appears as blue boxes when certain criteria are selected. For a patient with a new diagnosis of AF, for example, advice is given to exclude thyroid disease as shown below.

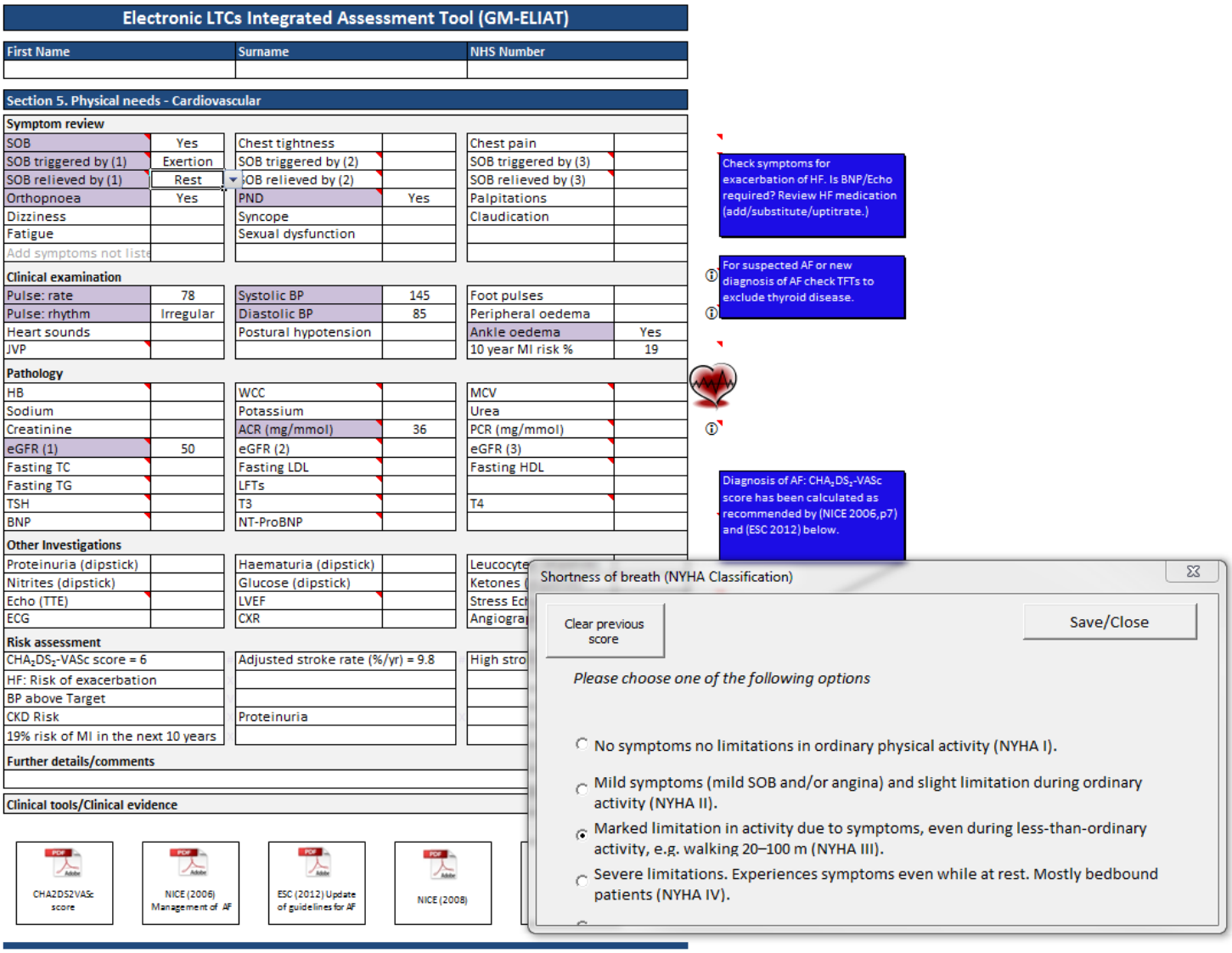


Figure 10: GM-ELIAT Physical Need: Cardiovascular page

7.3. Specific Features

Multiple select boxes appear on the right hand side of most pages to allow several entries to be stored, as shown in Figure 11 for adding ADL equipment or for clicking on the body map on the musculoskeletal page to locate pain (Figure 12). Hidden rows on the page open up to be filled as more options are selected.

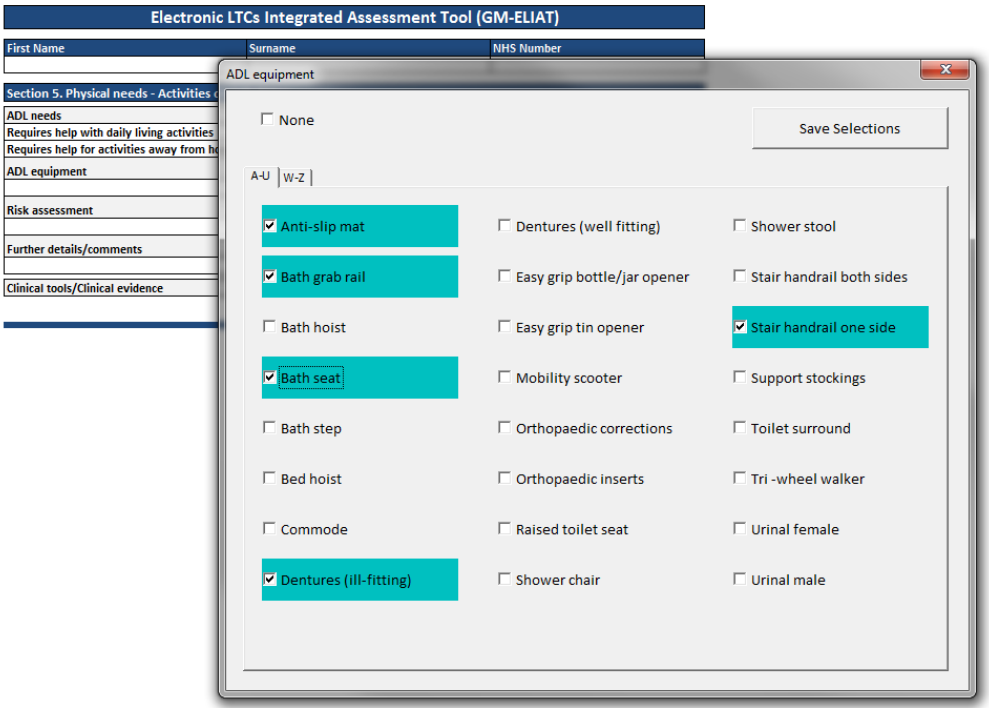


Figure 11: GM-ELIAT Multi- select boxes: ADL equipment

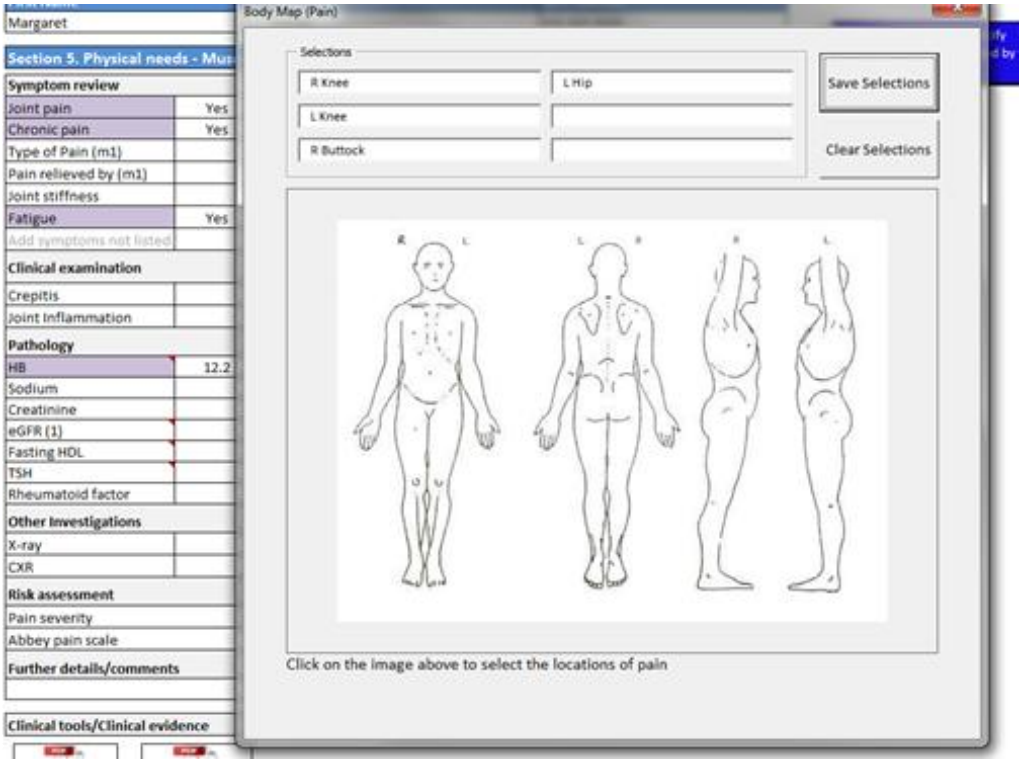
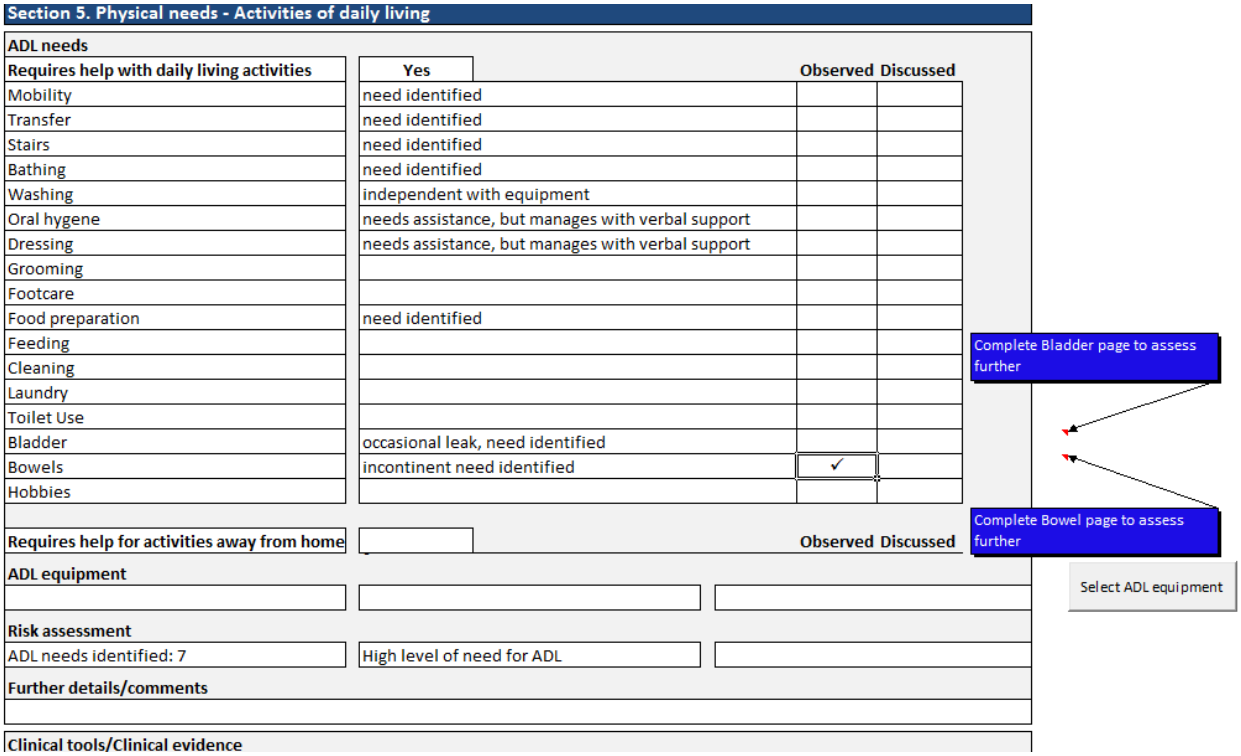


Figure 12: GM-ELIAT Multiple select boxes: Body map

On some pages to limit the amount of information displayed that is not always needed, rows are collapsed until activated. On the ADL page, rows are hidden unless 'yes' is selected for 'Requires help with daily living activities' the page then opens to reveal a series of assessment criteria with drop down box options. Each

activity of daily living is assessed to identify needs either by discussion or observation and discussion. The number of identified needs are calculated automatically and a level of need given. The same applies to 'Requires help away from home' which is currently collapsed in Figure 13.



Section 5. Physical needs - Activities of daily living

ADL needs

Requires help with daily living activities	Yes	Observed	Discussed
Mobility	need identified		
Transfer	need identified		
Stairs	need identified		
Bathing	need identified		
Washing	independent with equipment		
Oral hygene	needs assistance, but manages with verbal support		
Dressing	needs assistance, but manages with verbal support		
Grooming			
Footcare			
Food preparation	need identified		
Feeding			
Cleaning			
Laundry			
Toilet Use			
Bladder	occasional leak, need identified		
Bowels	incontinent need identified	✓	
Hobbies			

Complete Bladder page to assess further

Complete Bowel page to assess further

Requires help for activities away from home		Observed	Discussed

ADL equipment

Select ADL equipment

Risk assessment

ADL needs identified: 7	High level of need for ADL	

Further details/comments

Clinical tools/Clinical evidence

Figure 13: GM-ELIAT ADL page showing hidden and unhidden rows

Probing questions are used to gradually deepen the enquiry. For example, if 'regularly or occasionally consumes alcohol' is selected, 'units per week' appears highlighted in the right hand column and a blue pop-up box appears to advise that the Audit C questionnaire should be completed. This is accessed by clicking on the Audit C score cell. Once complete, the guidance disappears; the score is added to the risk assessment section with an interpretation (Figure 14). If however, 'no longer consumes alcohol is selected, 'alcoholic?' appears in the middle column and if yes is selected 'abstained for' appears in the right-hand column for the assessor to complete the length of time the patient has abstained from alcohol.

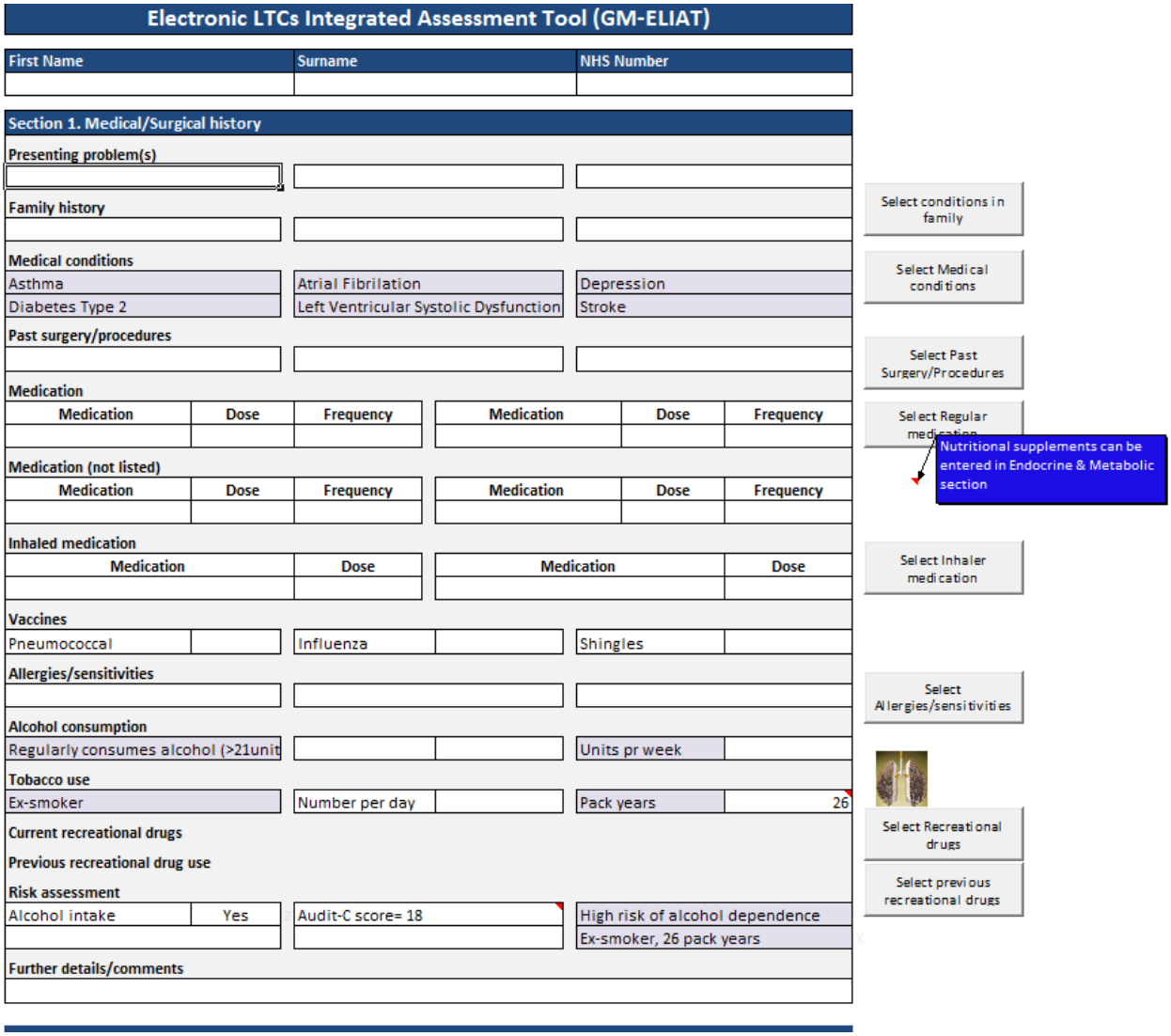


Figure 14: GM-ELIAT Medical/surgical history page showing revealed text

Due to limited space, many medical terms are abbreviated. The full terminology is available, however, and can be accessed by hovering over the red triangle within the cell, as shown in Figure 15.

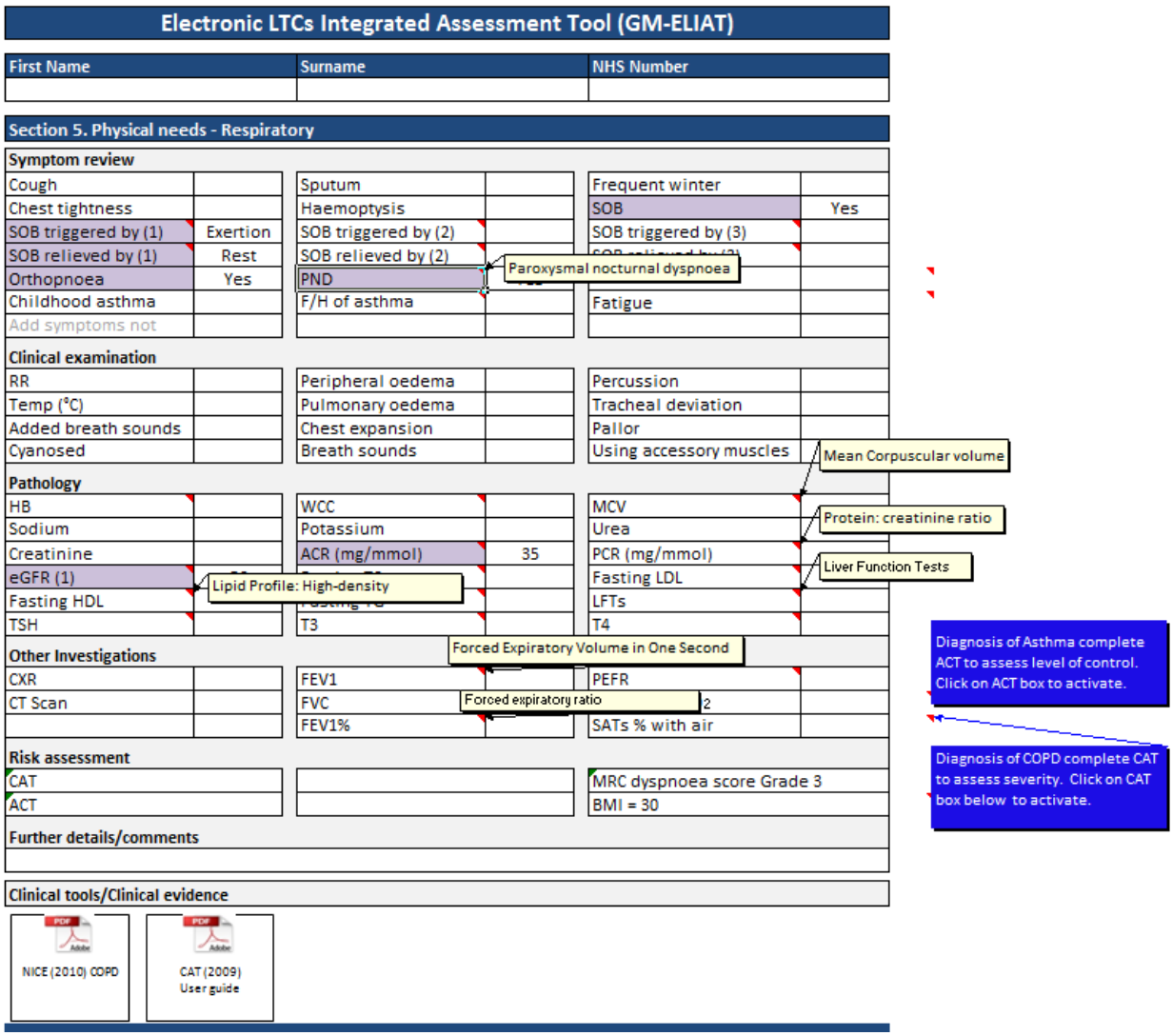


Figure 15: GM-ELIAT showing abbreviations in full.

Many pages contain health assessment questionnaires. These are validated tools already in use in clinical practice. Questionnaires appear when activated by selected cells and guidance is provided as to why the questionnaire should be completed. A warning message appears if the assessor tries to close the questionnaire before it is fully completed. Once complete, the score is calculated and the interpretation provided. Examples of embedded questionnaires are the Physical Health Questionnaire (PHQ-9) and the COPD Control Test (CAT) as shown in Figures 16a and 16b. Other embedded questionnaires are:

- The Audit C
- NYHA functional classification (symptomatic assessment of heart failure)

- MRC dyspnoea scale
- The Asthma assessment test (ACT)
- The Brief Pain Inventory (BPI)
- The Abbey pain scale (assessment of pain in people unable to articulate their needs)
- The Modified Rankin scale (for measuring the degree of disability after neurological trauma e.g. stroke)
- The Leeds Assessment of Neuropathic Sign and Symptoms (LANSS) questionnaire
- The Falls Risk Assessment Test (FRAT)
- The Malnutrition Universal Screening Tool (MUST) score
- The Waterlow score (pressure ulcer risk assessment tool)
- General Practitioner Assessment of Cognition (GPCOG)
- Six item Cognitive Impairment Test (6CIT)
- The Generalised Anxiety Disorder Assessment (GAD-7) score
- The Hospital Anxiety Depression (HAD) scale
- The Abbreviated Wimbledon Self Report Scale (mood assessment)
- The Medication Adherence Report Scale (MARS)

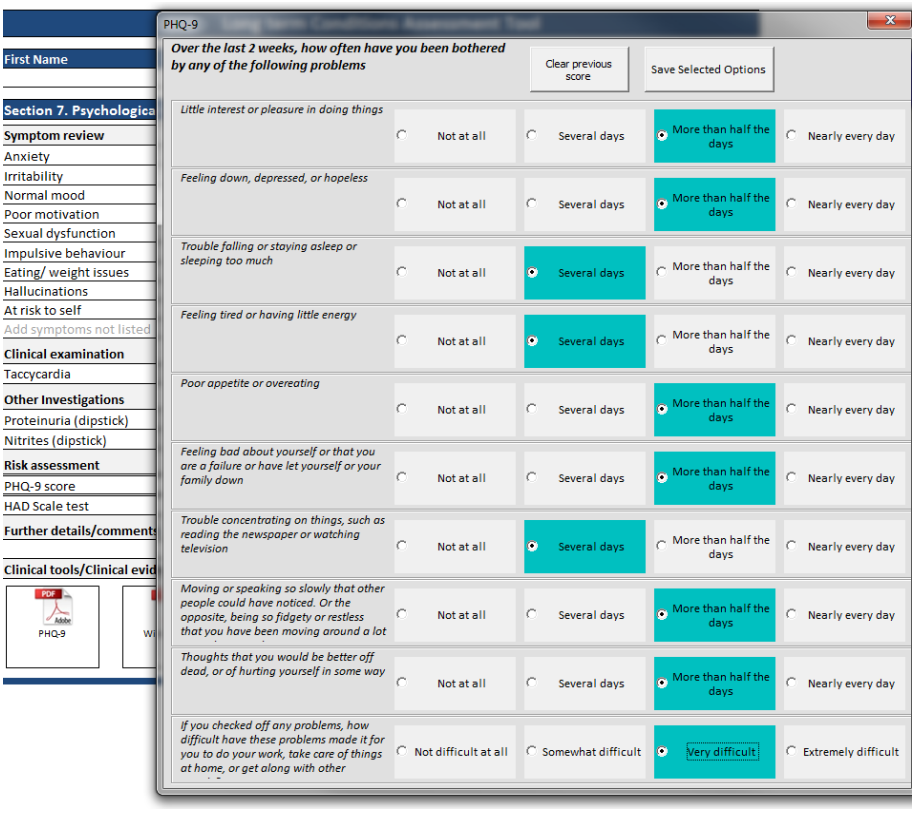


Figure 16a: GM-ELIAT Health assessment questionnaires: PHQ-9

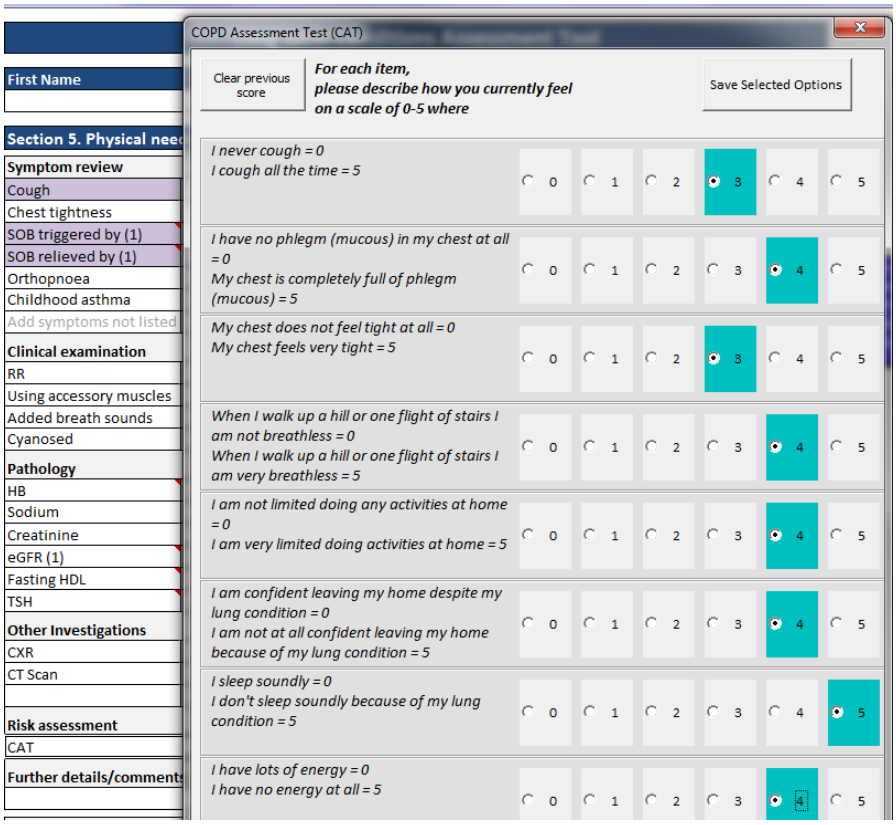
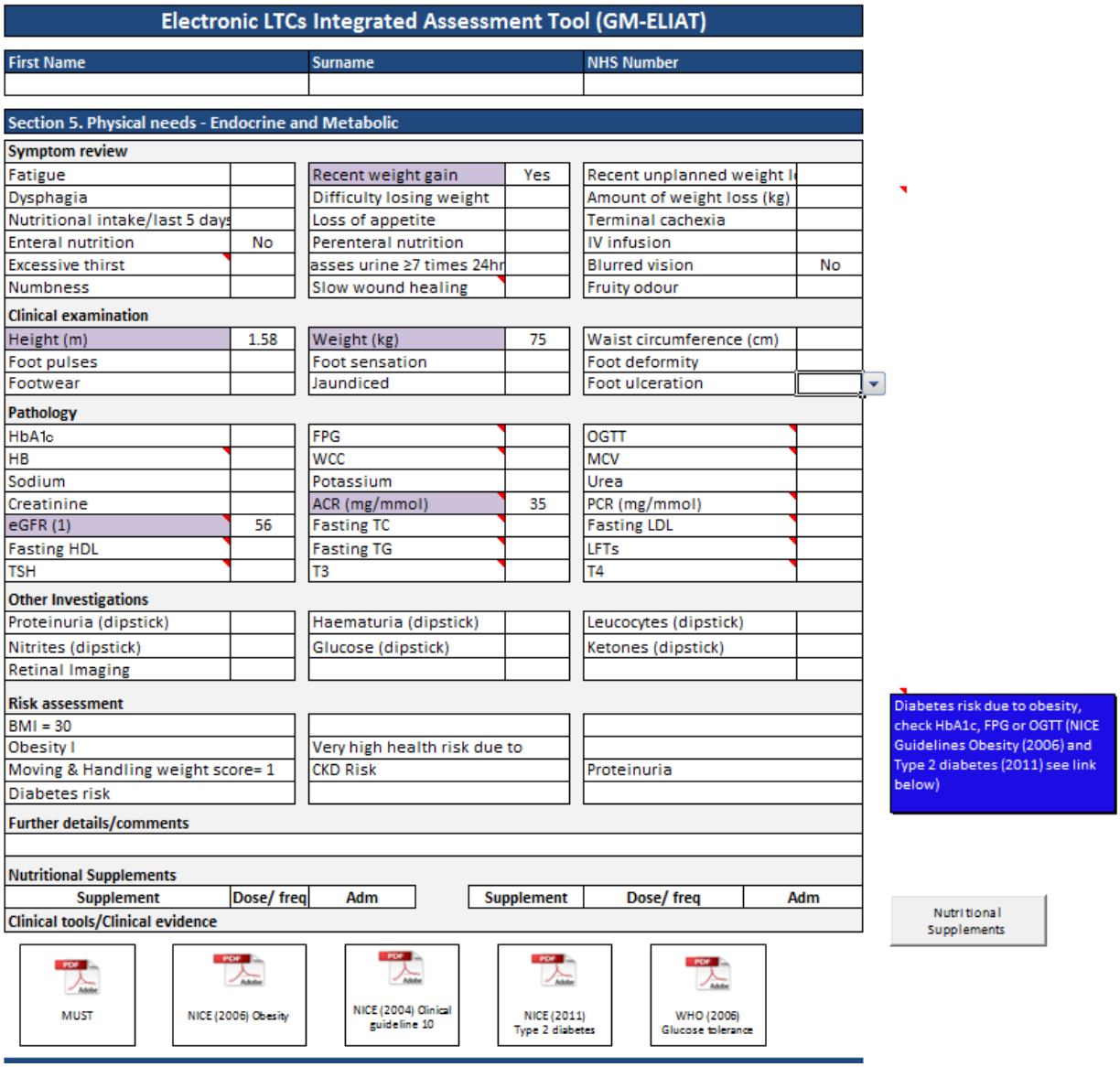


Figure 16b: GM-ELIAT Health assessment questionnaires: CAT

The risk assessment section appears towards the bottom of each page (Figure 14). Risks are calculated within the tool by the data inputted and are based on national and international guidelines such as NICE.[35] Risks may be generated by algorithms from demographic data already inputted for example, the CHA_2DS_2-VASc which defines stroke risk for patients with a diagnosis of AF. This will appear on the cardiovascular page (as previously shown in Figure 10) if at a minimum AF, gender and age cells are completed. Risks are also calculated from health questionnaires, as described above or calculated from cells completed on the same page, for example, the BMI is calculated from the height and weight, and a NICE classification of obesity provided on the Endocrine and Metabolic page (Figure 17).[36] If the BMI had been below 20 and the patient had lost weight and had poor dietary intake a MUST score would have been calculated giving a risk of malnutrition. Also shown in Figure 17, a CKD risk has also identified due to an eGFR result of 56ml/m. Risk assessments assist in identifying specific needs, defining the level of care required to reduce risks, defining the level of care required to manage patients effectively and avoid preventable deterioration of health and wellbeing. Clinical guidelines appear in blue boxes on the right of each page to guide practice according to

national and international guidelines. Links to guidelines or clinical tools used within the assessment tool appear at the bottom of each page allowing the assessor to find clinical evidence quickly, when required.



Electronic LTCs Integrated Assessment Tool (GM-ELIAT)

First Name	Surname	NHS Number

Section 5. Physical needs - Endocrine and Metabolic

Symptom review					
Fatigue		Recent weight gain	Yes	Recent unplanned weight l	
Dysphagia		Difficulty losing weight		Amount of weight loss (kg)	
Nutritional intake/last 5 days		Loss of appetite		Terminal cachexia	
Enteral nutrition	No	Perenteral nutrition		IV infusion	
Excessive thirst		asses urine ≥7 times 24hr		Blurred vision	No
Numbness		Slow wound healing		Fruity odour	
Clinical examination					
Height (m)	1.58	Weight (kg)	75	Waist circumference (cm)	
Foot pulses		Foot sensation		Foot deformity	
Footwear		Jaundiced		Foot ulceration	
Pathology					
HbA1c		FPG		OGTT	
HB		WCC		MCV	
Sodium		Potassium		Urea	
Creatinine		ACR (mg/mmol)	35	PCR (mg/mmol)	
eGFR (1)	56	Fasting TC		Fasting LDL	
Fasting HDL		Fasting TG		LFTs	
TSH		T3		T4	
Other Investigations					
Proteinuria (dipstick)		Haematuria (dipstick)		Leucocytes (dipstick)	
Nitrites (dipstick)		Glucose (dipstick)		Ketones (dipstick)	
Retinal Imaging					
Risk assessment					
BMI = 30					
Obesity I		Very high health risk due to			
Moving & Handling weight score= 1		CKD Risk		Proteinuria	
Diabetes risk					

Further details/comments

Nutritional Supplements

Supplement	Dose/ freq	Adm	Supplement	Dose/ freq	Adm

Clinical tools/Clinical evidence

MUST | NICE (2006) Obesity | NICE (2004) Clinical guideline 10 | NICE (2011) Type 2 diabetes | WHO (2006) Glucose tolerance

Diabetes risk due to obesity, check HbA1c, FPG or OGTT (NICE Guidelines Obesity (2006) and Type 2 diabetes (2011) see link below)

Nutritional Supplements

Figure 17: GM-ELIAT showing the risk assessments and clinical guidelines

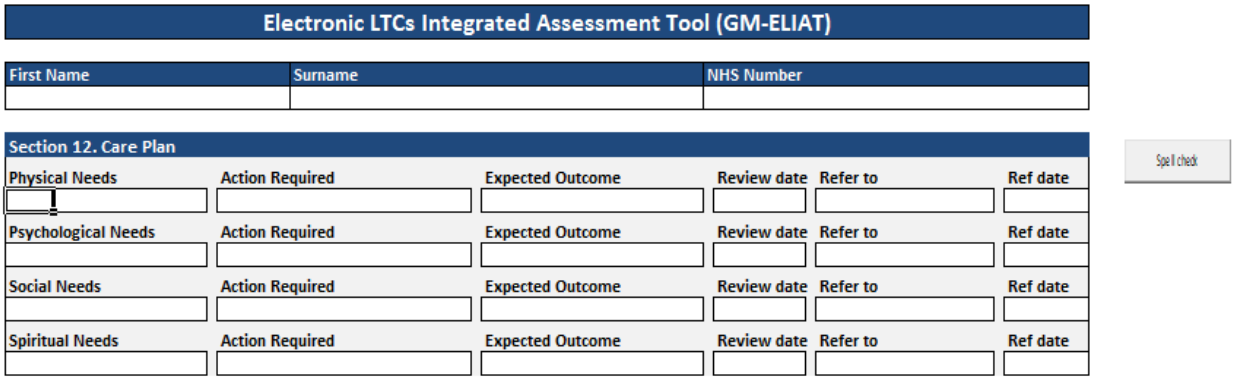
7.4. Summary Output and Care Planning

Data inputted culminates on a summary page. Findings from individual sections are brought together to provide an overall picture of the patient's symptoms, clinical examination findings, pathology/other investigations, needs and risks to health and social wellbeing. From this a care plan to be formulated (Figure 18).

Section 11. Summary		
Medical History		
Medical conditions	Atrial Fibrilation	Diabetes Type 2
	Glaucoma	Hypertension
	Left Ventricular Systolic Dysfunction (LVSD)	Rheumatoid Arthritis
Symptom review	SOB	Fatigue
	Nutritional intake/last 5 days fair	Poor memory
	Cough	Sputum yellow
	Frequent winter bronchitis	Joint pain in: R Hip, L Hip, L Knee, R Knee
	Balance problems	Fall in last 12 months
	Leak on coughing/laughing/sneezing	Tissue viability risk:
Clinical examination	Systolic BP = 145	Diastolic BP = 85
	Ankle oedema	Height (m) = 1.56
	Weight (kg) = 74	Difficulty rising from sitting
	Skin type oedematous	Mobility restricted
Pathology	eGFR (1) = 56	ACR (mg/mmol) = 35
	HbA1c = 8.5	MSU negative
Risk assessment	Increasing risk of alcohol dependence	Smoker, 25 pack years
	HF: Risk of exacerbation	CKD Risk
	Proteinuria	BMI = 30
	Obesity I	Very high health risk due to obesity
	Diabetes 9 key test not complete	CAT Impact level Medium
	Moderate pain	Pain relief score = 30%
	Significant cognitive impairment (6CIT)	Optometry examination date unknown
	ADL needs identified: 6	Moderate level of need for ADL
	M&H risk assessment score= 4	Needs away from home identified: 2
	Low level of need away from home	Pelvic floor weakness risk
	Risk of pressure sores	Moderate level of need for managing social affairs
	Incomplete informal carer support	Moderate risk of poor adherence
	Several barriers to adherence	Not using adherence aids
Requires help with daily living activities	Mobility need identified (observed/ discussed)	Stairs need identified (observed/ discussed)
	Bathing need identified (discussed)	Footcare need identified (observed/ discussed)
	Food preparation need identified (observed/ discussed)	Feeding need identified (observed/ discussed)
Social		
Social circumstances	Bedroom Access: Uses stairs	WC Access: Uses stairs
	Home Environment: Needs modification	Living Arrangement: Lives alone
Managing social affairs	Collecting prescriptions: Need identified	Benefits: Unsure whether benefits received
	Benefits assessments: Need identified	Home safety: Need identified
	Power of attorney: Need identified	Informal carer: Need identified: Unable to provide

Figure 18 GM-ELIAT Summary output

For testing purposes the care plan has been left blank apart from being divided into sections, as shown in Figure 19. The plan is to populate a large proportion of this from the summary findings once a full evaluation is complete. As 'Need' cells are completed, further rows appear to allow more needs to be added.



Electronic LTCs Integrated Assessment Tool (GM-ELIAT)

First Name	Surname	NHS Number

Section 12. Care Plan

Physical Needs	Action Required	Expected Outcome	Review date	Refer to	Ref date
Psychological Needs	Action Required	Expected Outcome	Review date	Refer to	Ref date
Social Needs	Action Required	Expected Outcome	Review date	Refer to	Ref date
Spiritual Needs	Action Required	Expected Outcome	Review date	Refer to	Ref date

Figure 19: GM-ELIAT Care Plan

Through our discussions with community healthcare teams we found that mobile IT devices are scarce across Greater Manchester. None of the services have tablet PCs, some have laptops but appear to have difficulties with network connectivity. For this reason, a paper version of the electronic tool was developed (Appendix 2). This was not a stand-alone form; it would be completed in the patient's home then the information downloaded onto the electronic version back in the office. The latter was necessary to allow scores to be calculated, interpretations to appear and the summary page to be formatted. The pilot evaluation project will now be described.

8. Project Design

The main stages of the project design were Recruitment, Facilitation, Evaluation and Refinement. The Model for Improvement was used to guide the evaluation process. The flow chart in Figure 20 presents the project design with the anticipated timeline for this pilot and the following section will describe the process in more detail.

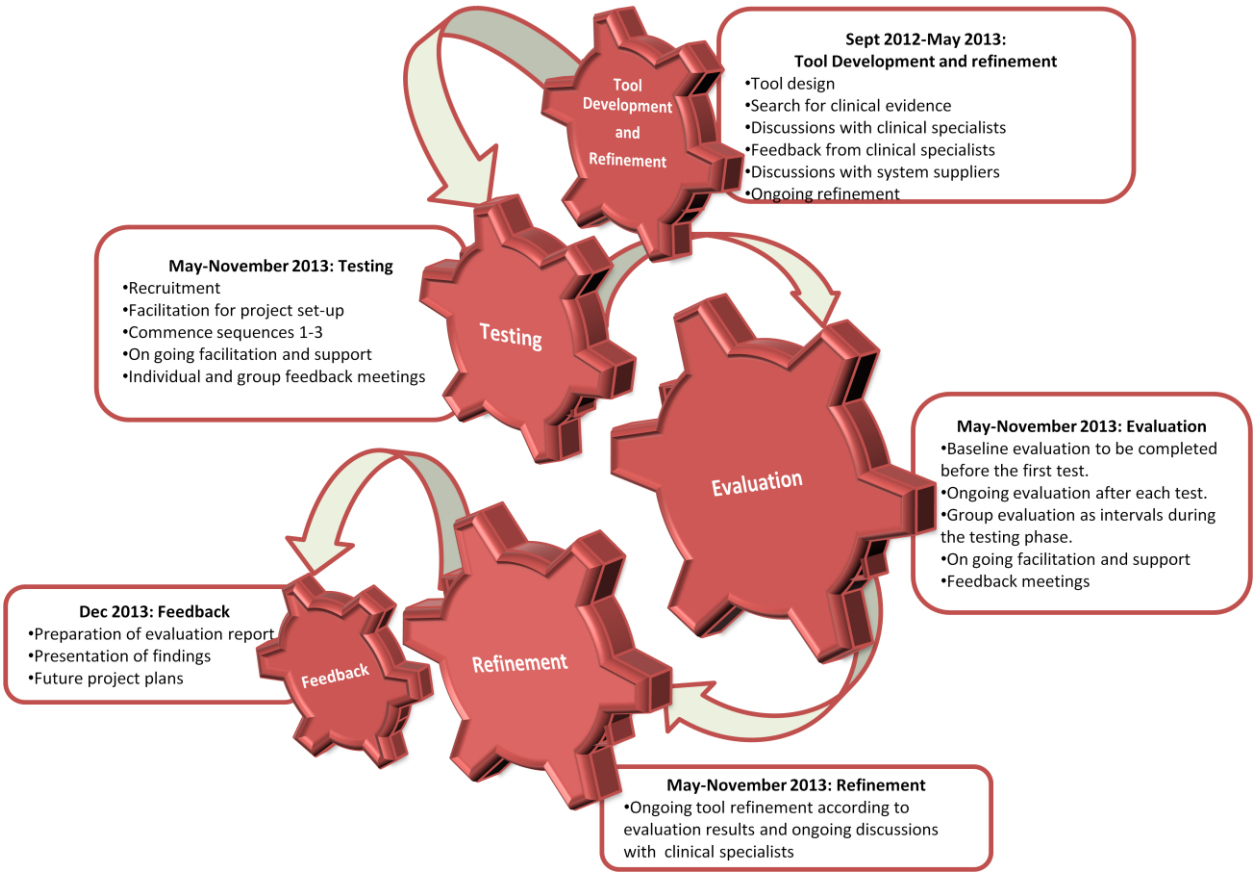


Figure 20: GM-ELIAT Project plan with timelines

8.1. Recruitment

This pilot project involved recruiting CM services across Greater Manchester to test the functionality and feasibility of the electronic assessment tool.

8.1.1. Introductory meetings

Project set-up meetings were held with senior services leads with the aim of recruiting CM services to test the GM-ELIAT. A full demonstration of the tool was given with a discussion regarding the evaluation process. The project lead also met with the community matrons who would be involved in the evaluation process either individually or as a group. In most cases the project lead was invited to a service team meeting to present the GM-ELIAT and discuss the project.

8.2. Facilitation and Support

Support was on-going throughout the project facilitated by the project lead and the data analyst attached to the project at the time of the testing phase. Both facilitators were easily contactable via email or telephone to deal with any issues arising. Regular facilitation was provided by face-to-face contact with individual CMs throughout the project. Facilitation sessions consisted of short meetings for CMs to feedback any particular comments about, or issues relating to the tool or process that had not been highlighted on the evaluation forms. Meetings were arranged on an individual basis to suit CMs time schedules. Group evaluation sessions were also held to fit in with CMs work schedules, one at the beginning of the project, following the first test sequence and an overall evaluation session at the end of the project.

8.2.1. Project Set-up Meetings

The project set-up meeting lasted approximately an hour. This meeting was attended by the project lead, data analyst and CM. Each CM received the following resources:

- A project plan.
- A user guide (Appendix 3).
- Paper versions of the GM-ELIAT.
- Paper versions of the health questionnaires that are embedded into the tool.
- The GM-ELIAT, (electronic version) downloaded onto their IT system.

Where possible, the GM-ELIAT was downloaded onto a shared drive that could be accessed by all CMs within the service. The tool was checked to ensure that it was functioning correctly on each desktop computer. CMs were instructed to keep only the blank master copy on the shared drive and save another copy to their personal folder to ensure that there was always a blank master copy available for use. The project lead gave a detailed tour of the tool. CMs were asked to try the tool during the meeting to:

- Assist them to become familiar with the tool prior to testing.
- Ensure that the project lead and data analyst were on-site to sort out any initial issues arising during familiarisation with the tool.
- Ensure that there were no errors with the tool that hadn't been picked up prior to meeting with the CM

At the end of the meeting participating CMs were asked to complete a short baseline evaluation to describe their current assessment process.

8.2.2. Facilitation Meetings

Facilitation was provided by face-to-face contact on a monthly basis throughout the project. Meetings were arranged individually to accommodate each CM's individual work schedules. Facilitation sessions consisted of short meetings lasting between 20 and 30 minutes for CMs to feedback any particular comments or issues with the tool or the process that had not been highlighted in the evaluation forms. CMs were given contact details for the project lead and data analyst for issues arising between facilitation sessions.

8.3. Evaluation

The evaluation involved a number of evaluation questionnaires completed via face-to-face interview, or electronically and returned by email. Questionnaires included baseline, test sequence 1-3 evaluations and a final evaluation. Completed assessments were also part of the evaluation process and as test sequence evaluations were embedded into the GM-ELIAT, these were easily emailed to the project lead for analysis and refinement of the tool. The evaluation methods were conducted in parallel to testing the tool and will now be described in more detail.

8.3.1. Baseline evaluation

A baseline evaluation questionnaire (Appendix 4) was completed at the end of or following the Project Set-up meeting via two methods:

- Face-to-face interview. The electronic or a paper form was completed by the project lead.
- Self-completion, electronically and emailed to project lead (where time was limited at the project set-up meeting).

The questionnaire took approximately 10 minutes to complete. Questions were related to the existing LTC assessment process. CMs were asked how long an assessment takes using the current documentation, whether there is repetition in the process, whether additional information needs to be obtained from the patient's GP, how this is obtained and the length of time it takes. Whether information is also obtained from

hospital records and how long this takes. Finally, whether the current assessment process contains adequate assessment criteria to complete a detailed assessment; without CMs using their knowledge and experience to fill in the gaps missing from the assessment tool.

8.3.2. Test Sequence 1 Evaluation

To test whether the GM-ELIAT contained all the assessment criteria that participating community services' own LTC assessment forms contained, CMs were asked to transfer assessment information from a recent patient assessment onto the tool and compare the results. They were then asked to complete a Test Sequence 1 evaluation (Appendix 5) which is embedded into the GM-ELIAT and appears on the demographics page. The evaluation questions were related to how long the transfer of information took, whether the tool was presented in a logical order, whether items were easy to find, whether everything from the current assessment forms could be easily transferred or whether anything was missing. Whether any additional information was produced by the tool that is not normally collected and whether the summary produced similar information to that written as free text in the existing assessment. CMs were asked to remove patient identifiable information from the assessment form prior to sending it to the project lead. Storing of electronic assessments was carried out in accordance with the Community Services Data Protection Policy.

8.3.3. Test Sequence 2 Evaluation

For the second test sequence, each CM was asked to replace their current assessment forms and assess new patients using the paper version of the tool in the patient's home, then transfer the information on to the electronic version back at their work base. It was made clear to CMs that this form is not stand alone and may miss relevant assessment results if the information is not transferred to the electronic version. Once information from the paper version had been downloaded onto the electronic version, CMs were asked to complete a test sequence 2 evaluation, remove patient identifiable information from the GM-ELIAT prior to emailing the completed assessment with the embedded questionnaire to the Project Lead. The questions were similar to test sequence 1 evaluation questions but referred to the paper and electronic versions being used in conjunction with each other.

8.3.4. Test Sequence 3 Evaluation

The third test sequence would only be performed where IT resources were available. CMs would use a mobile device to complete a new patient assessment by directly inputting the data into the tool during the assessment process. Once complete, the CM was asked to complete a test sequence 3 evaluation, remove patient identifiable information and email to the Project Lead as per previous assessments and evaluations. Again, the questions were similar but related to using the electronic version in isolation.

8.3.5. Final Evaluation

A final evaluation questionnaire (Appendix 6) was completed at the end of the project via two methods:

- Face-to-face interview. The electronic or a paper form was completed by the project lead or data analyst
- Self-completion, electronically and emailed to the project lead (where there was difficultly arranging a face-to-face evaluation meeting).

The questionnaire took approximately 10 minutes to complete. CMs were asked on average how long it took to complete a new patient assessment with the GM-ELIAT and how many consultations were required? CMs were then asked to score each assessment process; the Trafford SAP and the GM-ELIAT, on a scale of 0 to 10 to judge whether they provide an efficient, detailed and holistic assessment process. Whether they address patient's self reported needs and whether they are time efficient. CM's judged whether quality was enhanced by clinical questionnaires, whether they guided practice with easy access to evidence based guidelines and whether each process assisted in identifying educational needs and improving knowledge for less experienced HCPs.

8.4. Data Analysis

Analyses involved data from the assessment tool and the evaluation forms. CMs feedback and comments have been summarised and reported qualitatively whilst statistical information has been treated quantitatively. Demographic variables and individual scores for the current system and the GM-ELIAT are expressed in frequencies, means and standard deviations (SD). The mean difference (MD) was calculated for interval data and expressed with 95% confidence intervals (CIs), to compare differences in scores between the current process and the GM-ELIAT. Individual scores were grouped into themes; time efficiency, quality and

educational content, and reanalysed to obtain theme scores. Scores were then combined to obtain an overall score and the MD recalculated. Score differences were analysed by the paired t test. Tests were two-tailed with $\alpha = 0.05$. Given the very small sample size, findings should be viewed as being tentative; test results must be interpreted with caution, and MDs and their CIs should be assessed carefully in practical terms in terms of the size and direction of the of the MD and the width of the CI. Analysis was conducted in IBM SPSS 20.

8.5. Refinement

Refinement took place throughout the development phase once new information was gathered either by an ongoing literature review, following feedback from testing and from healthcare professionals across Greater Manchester. Refinement following testing tool took place after each test, according to the results and prior to the next sequence, the refinement process was determined by the outcomes of each test.

9. Evaluation Results

The results that follow derive from the self-report evaluation forms; baseline, test sequences and final providing mainly quantitative analysis and from information entered into the GM-ELAIT itself during assessments this comprises of assessment criteria missing, suggestions regarding format etc and is written up as a qualitative summary.

9.1. Service Recruitment

Meetings were held with service commissioners, lead community matrons and community service leads, such as the Divisional Director/ Chief Nurse for Trafford Community Services and Pennine Care's Strategic Lead for Long-term Conditions, to recruit community matron services within Trafford, Central and North Manchester and Bury. There was a lot of interest in the tool but unfortunately we were only able to secure the Trafford CM service for the pilot due other priorities and service issues within the other community services.

9.2. The Trafford Community Matron Service

Since April 2013 Trafford community services have been funded by Pennine Care Community NHS Trust. The community matron service is staffed by a small team of highly experienced advanced nurse practitioners. At the start of this project there were seven CMs; six generalist, and one specialist (dementia care). CMs were attached to between six and nine of the 36 GP practices across Trafford; depending on the geographical area they cover. The dementia care CM's remit was (and still is) Trafford wide. Practices are divided into neighbourhoods; North, West, Central and South and CMs work across the neighbourhoods. Practices within North, West and Central neighbourhoods were split between CMs. Some matrons had support nursing staff working with them. The demographic details for Trafford practices are listed in Table 2.

Table 2: Demographic details for practices that community matrons are attached to

Neighbourhood	Number of Practices	Patient Population	Number of Patients with LTC*/ (%)
Central	7	60568	2397 (2.8)
North	9	51746	1456 (4.0)
South	12	59115	1916 (4.0)
West	8	52023	2060 (3.2)
Total	36	223452	7829 (3.5)

A major change to the community matron nursing service took place in October 2013, with the introduction of the urgent care service. This service improvement initiative, aimed at reducing hospital admission, by providing intensive 72 hour nursing care at home for patients in acute risk of hospital admission. At the end of (or within) the 72 hour cover period patients are referred on to the CM service for continuation of care, admitted to hospital if care cannot be sustained at home or discharged. One of the CMs was redeployed to lead the urgent care service and her workload was reassigned, two CMs left the service to take up posts elsewhere and further redeployment of support nursing staff to the new service left the remaining CMs under increased pressure with up to a 50% increase in caseload. Preparation for this new service from June to October and the reduction in workforce was ongoing throughout the testing period and had significant impact on the evaluation and resulted in a four-month postponement of the project from June to October. This left only a month of testing. On re-launching of the pilot, CMs were still under workload pressure and there

remained internal issues within the Trust with regard to the amount of paper work they had to complete as part of the Trafford SAP as well as completing the GM-ELIAT. The clinical lead for the urgent care service agreed to test the tool but as she was in the process of establishing the service and managing a new workforce this limited the time she could spend on testing the tool. Figure 21 provides revised pilot timelines in light of these issues.

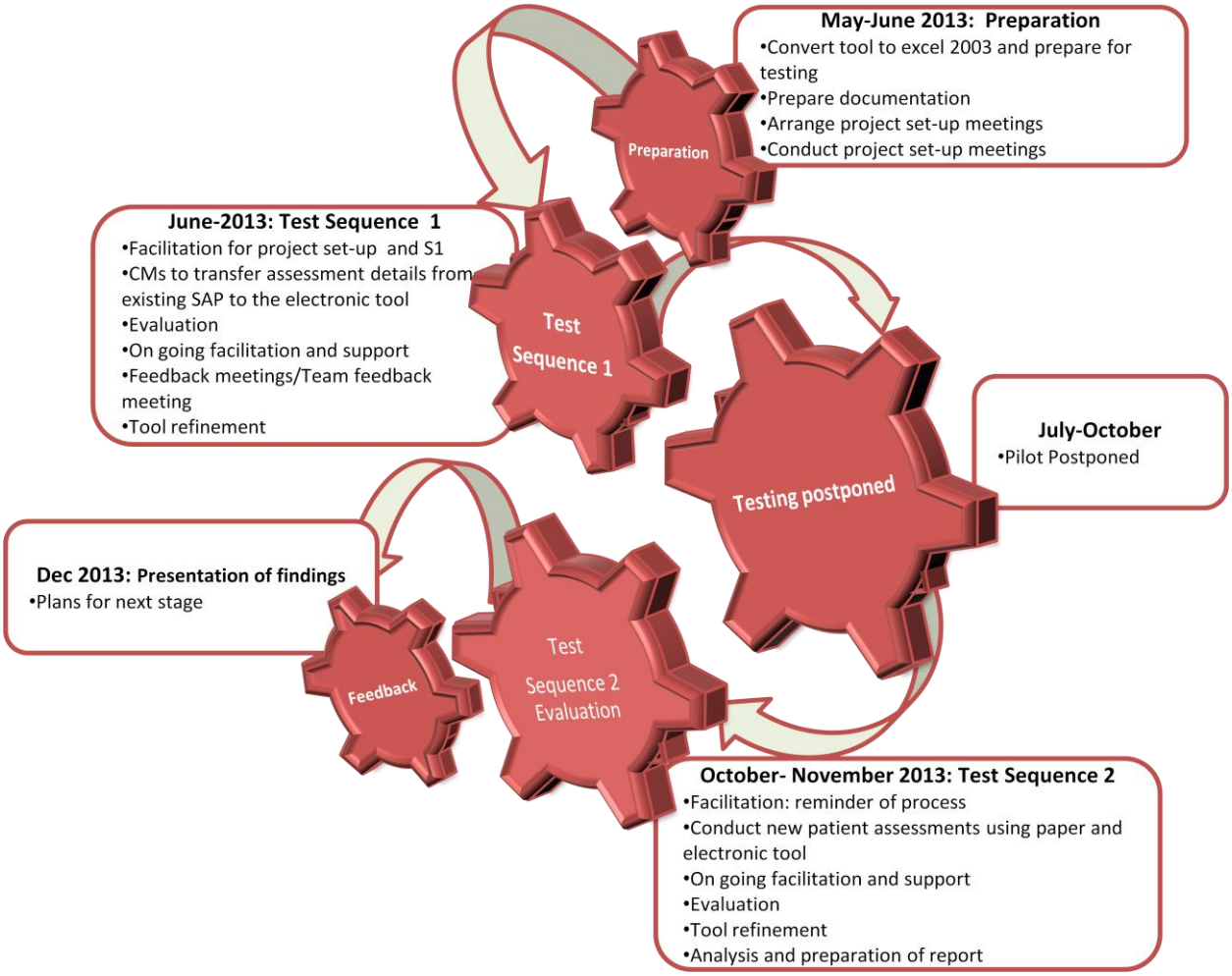


Figure 21: GM-ELIAT Revised project plan with timelines

Advanced Nurse Practitioners roles have now been reconfigured to incorporate four CM's with support staff each covering a neighbourhood and all GP practices within that neighbourhood, a dementia care CM with support staff, who covers all GP practices and the Urgent Care Service incorporating a team of ANPs and support nursing staff . Seven CM's were involved in the pilot at baseline and five for the final evaluation. All were very experienced nurses; with over 20 years experience as a nurse (mean 27.2, SD 6.1) and over seven years experience as an advanced nurse practitioner (mean 7.8, SD 0.5) in a CM role.

9.3. Current assessment process

The current assessment process involves the Trafford Single Assessment Process (SAP). This is based on the generic SAP[29] but has been modified to incorporate a number of forms specifically designed by Trafford services. There are a number of paper based forms that are held in a ring binder which sits in the patient's home. All community and primary care personnel who look after the patient should complete the appropriate sections of the forms each time they are in contact with the patient. If used correctly, this would provide shared care across community and primary services. CMs reported, however, that the Trafford SAP is not utilised for the purpose it was designed for. The folder is quite large; patients do not take it with them to their GP or hospital/community clinic appointments. GPs rarely complete it whilst visiting the patient at home and other health and social care professionals do not consistently use it. Community nursing services are the main users. The folder contains a number of documents as listed:

- Demographic details
- Overview assessment
- Each service's assessment form, such as the Advanced nurse practitioner's assessment form
- Risk assessment forms
    - Moving and Handling
    - Pain assessment
    - Tissue viability
    - Falls risk
- Care plan

A number of these forms repeat the same information but are required by other community services and must be completed before referrals can be made. ALL CMs reported that they had to repeat demographic information, risk assessment details, clinical information and carer information.

The mean consultation time, for a new patient assessment, with the Trafford SAP, was 2.7 hours (SD 0.5). The number of home visits ranged from two to five with a mean of 3.1 (SD 1.1). CMs reported that new

assessments are rarely completed at one visit; patients may lose concentration, information is needed from GP or hospital records and information is required from other services.

CMs collect information from GP practices to assist their assessment, such as demographic information, medical history and prescribed medications, this is either obtained by fax or copied from the GP records and takes between 50 and 80 minutes to collect (mean 61.4, SD 9.0), this includes travelling time. Time is also spent obtaining information from hospital records such as lab results, changes to prescribed medication, referral history and other information gathered from discharge letters. This takes between 20 and 60 minutes (mean 52.9, SD 15.0). CMs also update GP records with findings once they have completed the assessment, developed a care plan and referred the patient to other services as appropriate, this takes between 15 and 60 minutes with a mean completion time of 43.6 minutes (SD 19.3). Overall, it takes between 1.4 and 3 hours to gather information and update records manually (mean 2.6, SD 0.6) and between 4.4 to 8 hours in total (mean 5.6 hours, SD 1.2). Figure 22 shows the mean time range for each CM at baseline, from the time spent in the patient's home to completing the SAP in total (including the additional time required for the assessment process; gathering information from GP and hospital records and updating GP records).

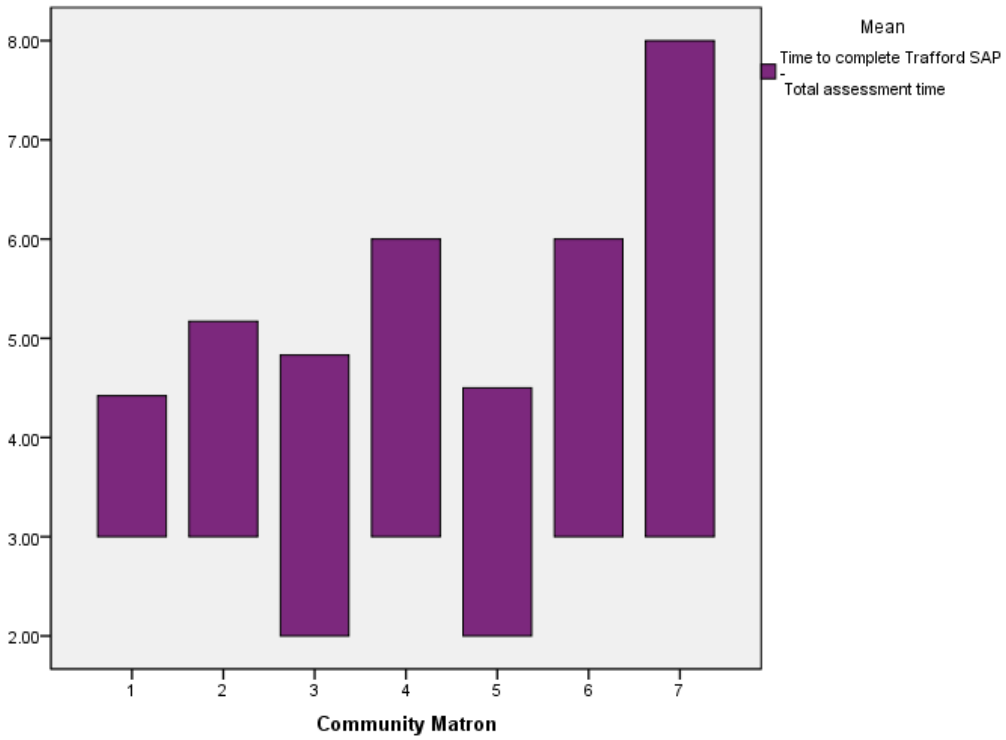


Figure 22: Time range from completing SAP to completing the assessment in full

CMs scored their own assessment process on a scale of 0 to 10 on a number of items relating to the quality of assessment, the time it takes, the educational content for less experienced nurses and how well it addresses patients' self-reported needs. The mean scores for whether the Trafford SAP provided an efficient assessment process or a detailed assessment were 5.4 (SD 2.4) and 5.0 (SD 1.6) respectively. The mean score for the SAP as a holistic tool was 5.6 (SD 1.8) and for addressing patients' self-reported needs was 5.4 (SD 1.9). CMs reported that they were required to write a considerable amount of free text (mean 4.4, SD 2.3) and repeat a lot of information (mean 3.8, SD 1.8) across the different forms that comprise the Trafford SAP. The combined scores for items relating to time efficiency for the SAP produced a mean score of 12.0 (SD 6.4) out of a total of 40. For quality, the SAP attained a mean score of 24.0 (SD 9.2) out of 60, and for educational content, a mean score of 5.0 (SD 7.1) out of 40. Only two CMs scored educational content items above zero. Time efficiency, quality and educational content scores were collated to produce a mean overall score of 41.8 (SD 18.5 out of 140). Figure 23 presents the mean scores for quality, time efficiency, educational content and the overall score for the five CMs who took part at this stage of the project (this was undertaken at the final evaluation to compare both assessment processes). Findings from the testing sequences will be described next.

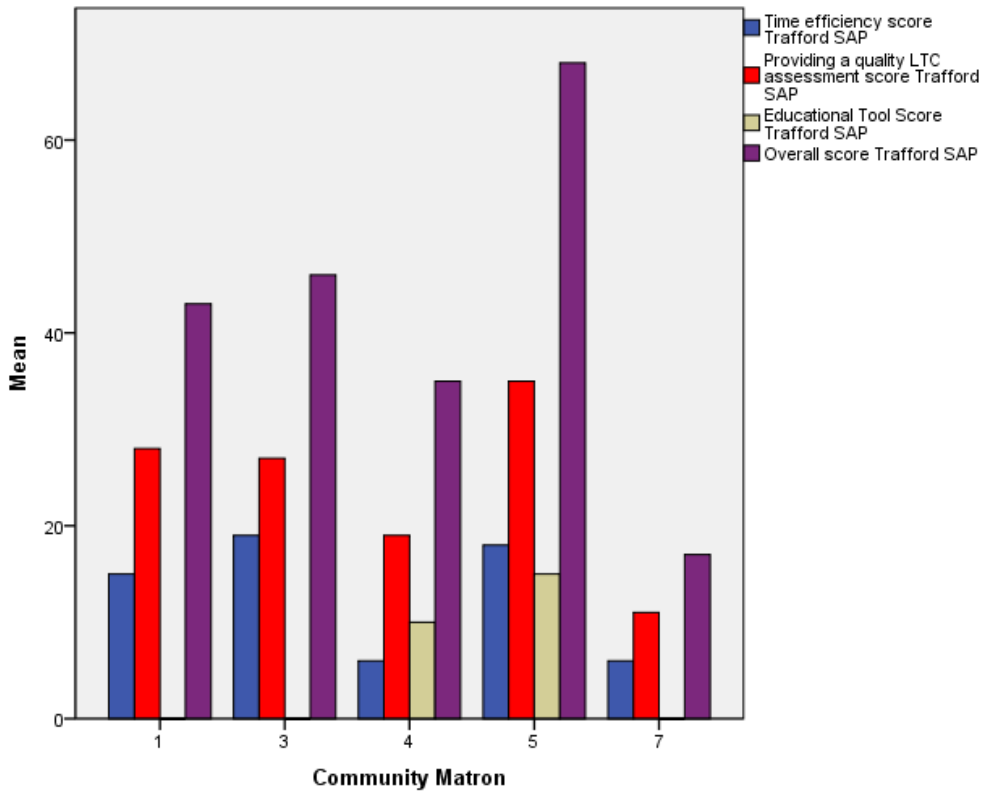


Figure 23: Bar chart showing CMs scores for the Trafford SAP across a range of items

9.4. Test sequence findings

For sequence one testing it took between 45 and 60 minutes (mean 50.4, SD 5.7) to transfer the assessment information from the Trafford SAP. CMs reported that the GM-ELIAT was organised in a logical order and sections were easy to find, however, as CMs were unfamiliar with the tool, it took longer to find sections they needed than it would if they had been more familiar with the layout. They also reported that as the layout of the Trafford SAP and GM-ELAIT were completely different it required them to click back and forward on different pages of the electronic tool to locate the sections they were up to on the Trafford SAP. As the Trafford SAP did not contain as much detail as the GM-ELIAT, many of the GM-ELIAT's sections were incomplete once the information had been transferred; this resulted in the automated summary being less informative than it might have been if the GM-ELIAT and not the SAP had been used to collect assessment information directly. Missing assessment criteria was noted to allow refinement of the tool to take place and mainly consisted of regular medication and diagnoses from the multi-select boxes, also a few items from the demographic, assessment and social pages, such as pharmacy contact details, recording information on

gaining access to the patient's home and risks to staff e.g. pets and safeguarding information. A few system errors were also flagged-up which caused difficulties with the flow of the assessment and were promptly corrected by the data analyst.

Test sequence two was conducted by CMs who were able to complete assessments using the paper version of the tool in the patient's home. This information was then transferred to the electronic tool. CM's reported that it took one hour to complete. Two home visits were still required for reasons discussed earlier. As they were not able to use the GM-ELIAT for all new patient assessments as originally envisaged they were still not familiar with the tool (paper and electronic versions) to reduce the completion time but they felt that with more use they would be able to speed the process up even further. CMs reported that the format of GM-ELIAT was organised in a logical order and sections were easy to find, but there was still some flicking backwards and forwards due to the nature of the assessment process. Assessments are patient-led; as the patient talks CMs record information. With the Trafford SAP, most of the information is entered as free text, so can be written as the patient talks but for the GM-ELIAT there is more structure and defined sections to complete, mainly as tick boxes. CMs found that they wrote information as free text with the patient; then completed the form back in the office. They felt, however, with more time to become familiar with the tool they would know where to input the information as the patient talks. Missing items were minimal, again mainly medications and diagnoses but these items are not relevant to the tool and have only been added for testing purposes, whilst the tool is in its current excel format. As an integrated tool within a clinical system, these sections would be populated from the patient record. Again, a few software errors were flagged-up which caused difficulties with the flow of the assessment and were promptly corrected by GM CLAHRC's data analyst.

Unfortunately, we have no findings for Test Sequence 3 as CMs did not have reliable mobile devices to enable electronic assessment to be conducted in patients' homes. Some CMs had laptops but they had difficultly logging into them remotely, or felt that a laptop was an intrusive device to use during the assessment with the patient, therefore, decided not to use them.

9.5. GM-ELIAT assessment process

CMs scored the GM-ELIAT for the same items as for the Trafford SAP. The mean scores for whether the GM-ELIAT provided an efficient assessment process or a detailed assessment were 7.8 (SD 0.5) and 7.8 (SD 0.5) respectively. The mean score for the GM-ELIAT as a holistic tool was 7.6 (SD 0.9) and for addressing patients' self-reported was also 7.6 (SD 1.5). CMs reported that the tick boxes provided adequate detail and reduced the need for excessive free text, with mean scores of 7.8 (SD 0.8) and 8.0 (SD 0.7) respectively. CMs found that they could provide all the information required to produce detailed enough referrals to other community services without having to repeat information (mean 8.2, SD 0.8). This process was particularly speeded up by automatic calculations in the tool without the need for CMs to produce the calculations for risk assessments themselves; e.g. Moving and Handling, 6CIT and the Waterlow scale. The combined mean score for items relating to time efficiency for the GM-ELIAT was 32.2 (SD 3.3) out of a total of 40. For quality the mean score was 47.2 (SD 4.9) out 60 and educational content 32.6 (SD 5.4) out of 40. Time efficiency, quality and educational content scores were collated to produce a mean overall score of 112.8 (SD 12.9) out of 140. Figure 24 presents the mean scores for quality, time efficiency, educational content and the overall score for the GM-ELIAT.

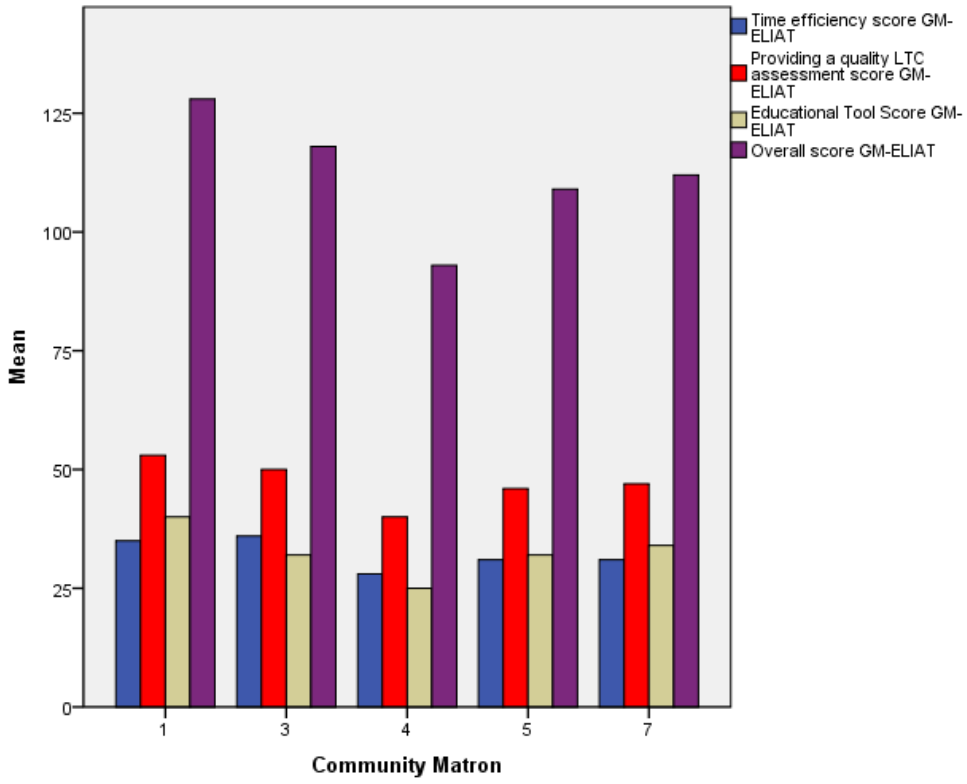


Figure 24: Bar chart showing CMs scores for the GM-ELIAT across a range of items

9.6. Comparison of assessment processes

GM-ELIAT scores were found to be higher than the Trafford SAP across all items. CMs reported that the GM-ELIAT delivered a more efficient assessment process (MD 2.40, 95% CI -0.46 to 5.26) and addresses patients' self-reported needs more effectively than the Trafford SAP (MD 2.20, 95% CI -0.19 to 4.59). Figure 25 present the 95% confidence intervals for both paired comparisons.

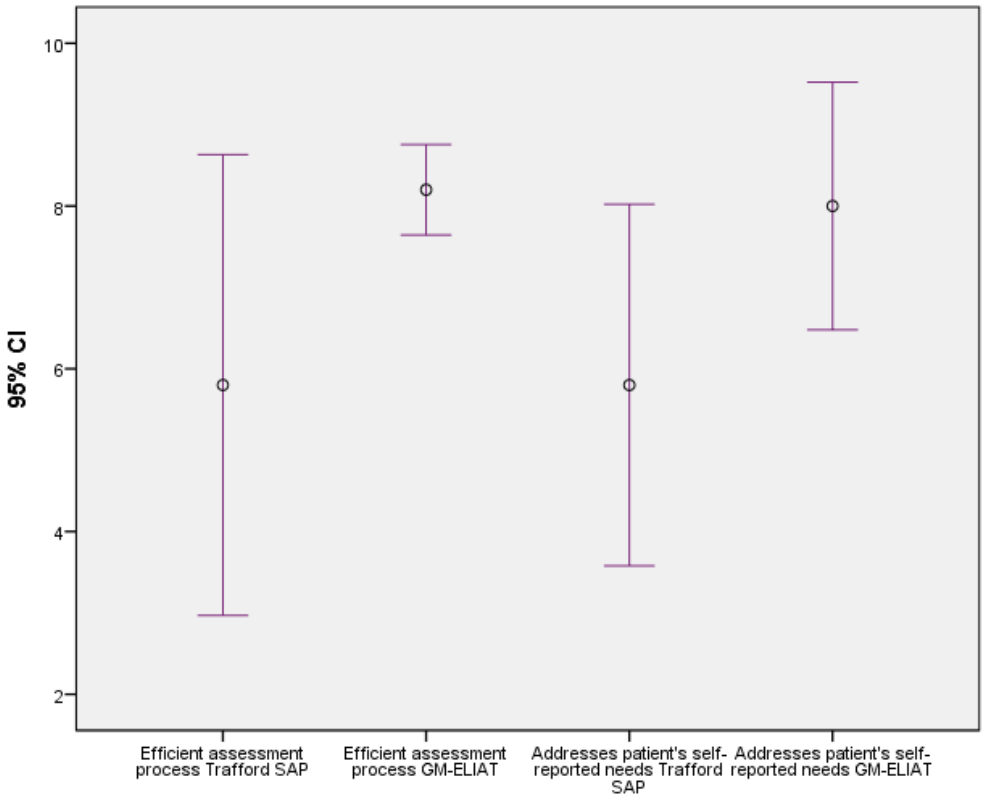


Figure 25 Error bars showing higher scores for GM-ELIAT for efficiency and addressing self-reported needs

The GM-ELIAT provided a more efficient assessment process than the Trafford SAP (MD 2.40, 95% CI -0.46 to 5.26) and a more detailed (MD 2.80, 95% CI 0.96 to 4.64) holistic assessment (MD 2.00, 95% CI -0.32 to 4.40). Figure 26 shows the increase in mean scores from the SAP to the GM-ELIAT for delivering a more detailed and holistic assessment.

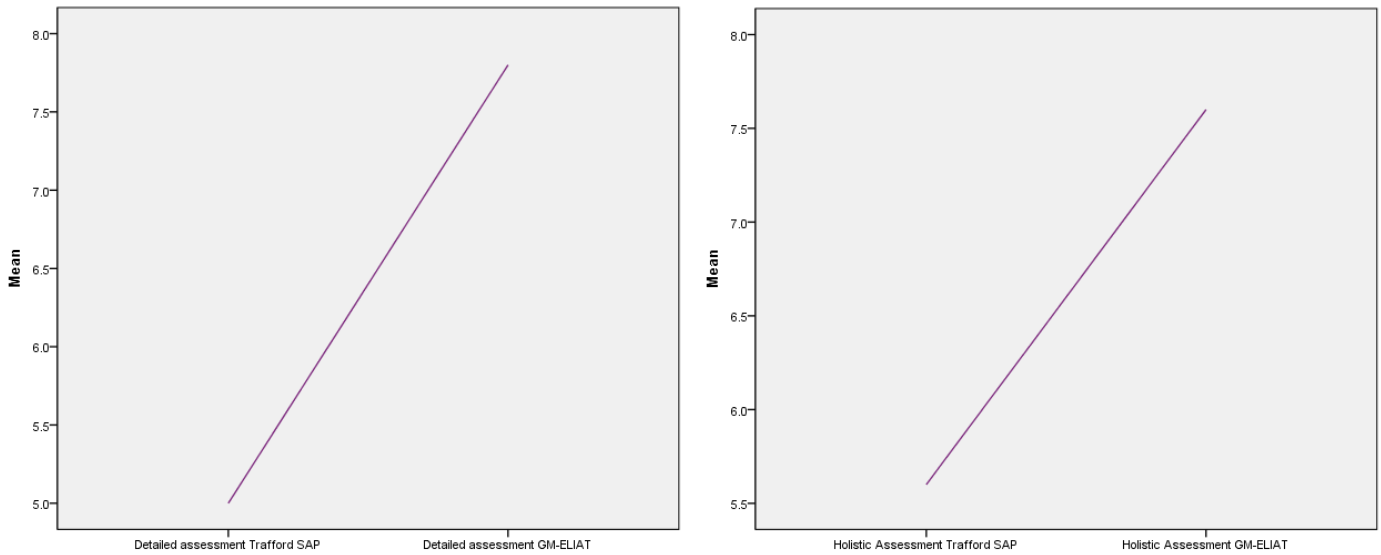


Figure 26: Line graphs showing higher mean scores for GM-ELIAT for detailed and holistic assessment

As predicted, the GM-ELIAT scored higher than the SAP for items relating to calculations and interpretations of questionnaires to enhance the quality of assessment (MD 8.00, 95% CI 6.03 to 9.96) and speed of the process (MD 8.00, 95% CI 6.03 to 9.96) as shown in Figure 27.

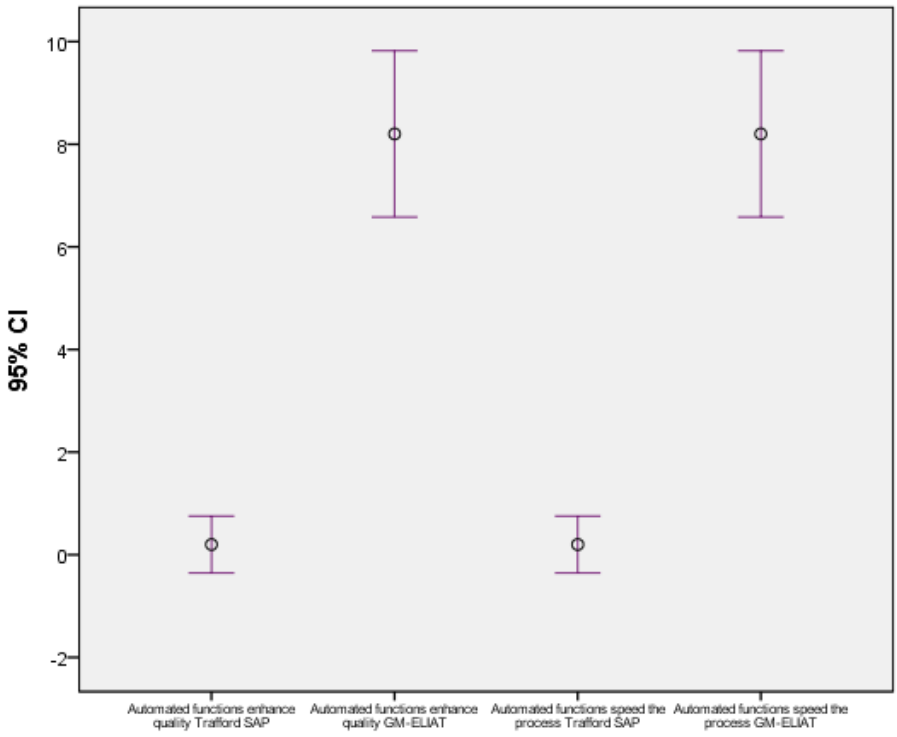


Figure 27: Error bars showing higher scores for GM-ELIAT for automated functions

Combined scores found the GM-ELIAT to be an improvement on the Trafford SAP for time efficiency (MD 19.40, 95% CI 13.67 to 25.13), providing a quality assessment (MD 23.20, 95% CI 12.08 to 34.32, Figure 25) and educational content (MD 27.60, 95% CI 13.92 to 41.28). Figure 28 presents an area graph showing the larger proportion taken up by the GM-ELIAT for providing a quality assessment. Figure 29 shows an even larger proportion for education content.

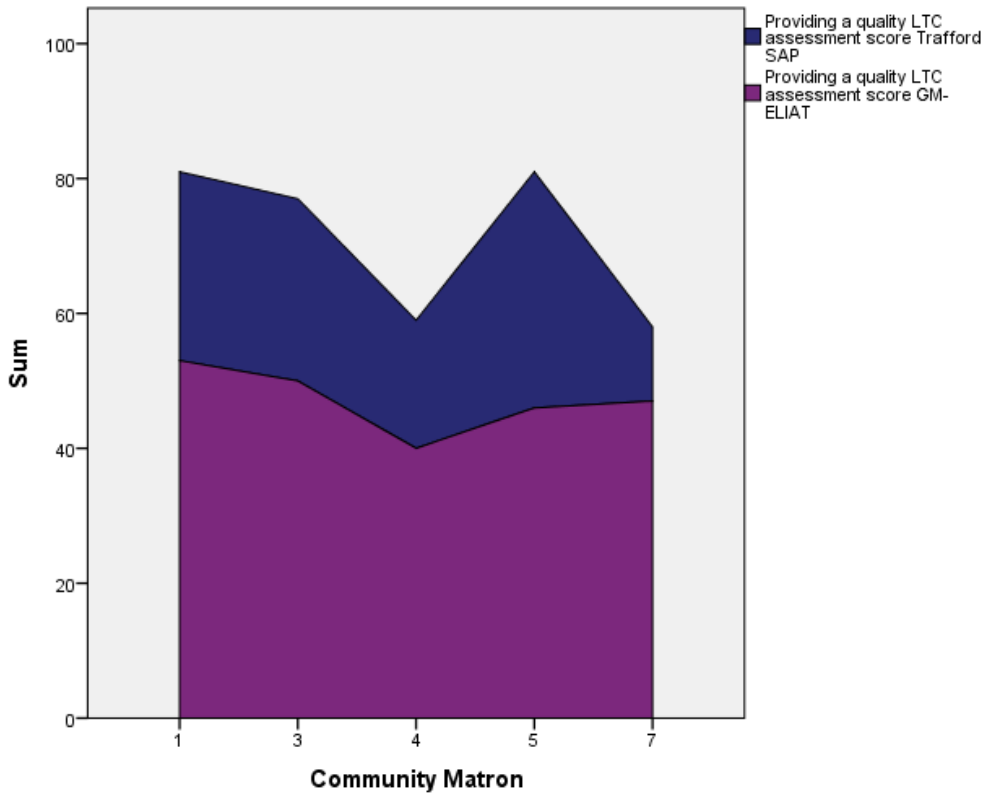


Figure 28: Area graph showing higher scores for GM-ELIAT for combined quality scores

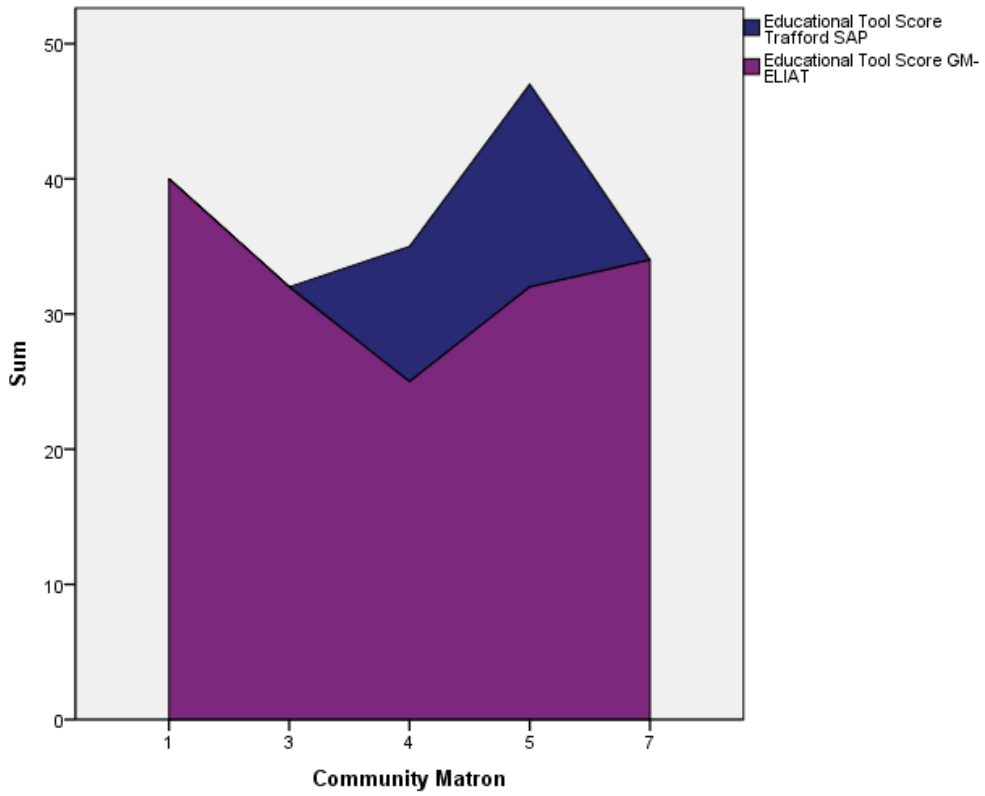


Figure 29 Area graph showing higher scores for GM-ELIAT for combined educational content scores

Overall scores for the 14 items found a mean difference of 70.20 (95% CI 43.58 to 96.82). Figure 30 shows the difference between the overall scores; for the Trafford SAP; three scores were very close to the mean whilst there was a difference of 51 for the lowest to the highest outliers. For the GM-ELIAT, all scores were closer to the MD.

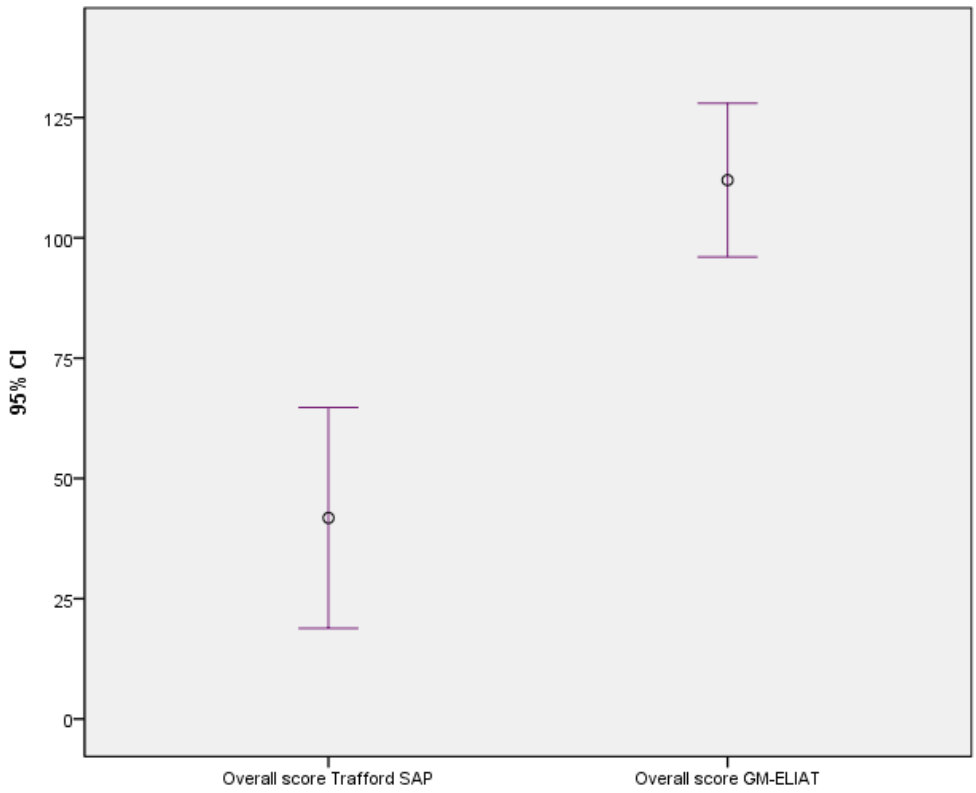


Figure 30: Error bars showing higher overall scores for GM-ELIAT

Although the GM-ELIAT provides an integrated assessment for a person with multimorbidity it does not currently work as a tool to electronically, share patient information across an integrated team, however, information produced by the tool such as the demographics, assessment details, assessment summary and care plan can be shared via secure email or in paper form. When CMs were asked to score both processes on their capability or potential capability to enhance integrated care, the GM-ELIAT scored higher than the Trafford SAP (MD 3.60, 95% CI 1.03 to 6.18), Figure 31 presents the difference in scores.

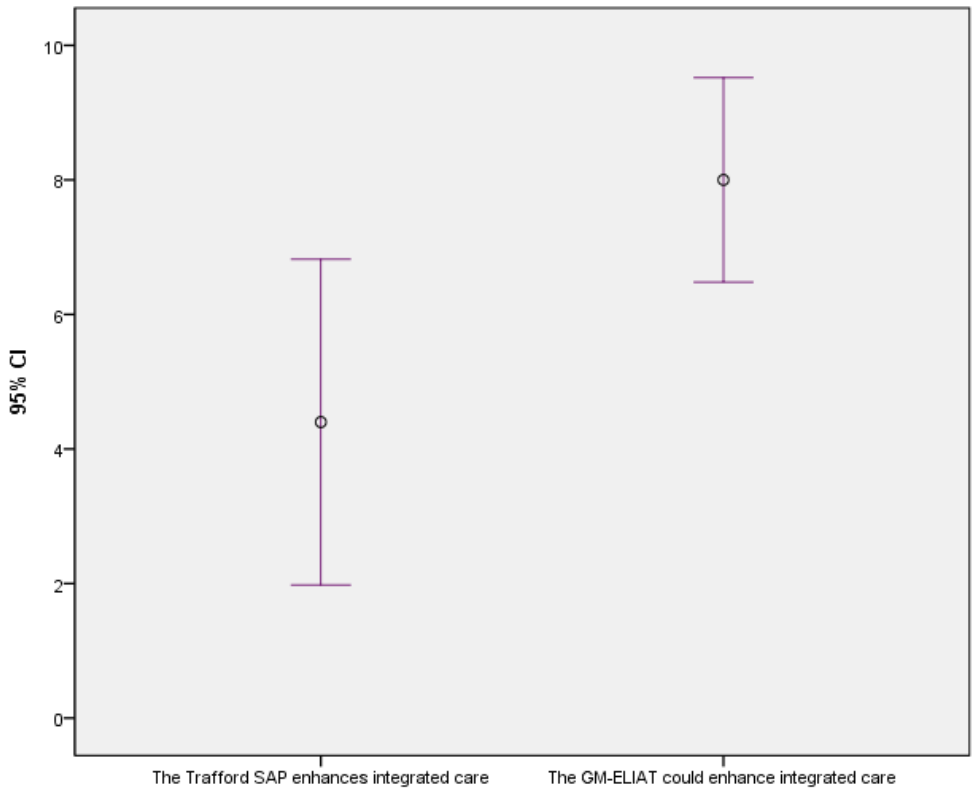


Figure 31: Error bars showing difference in scores for enhancing integrated care

For closer comparison, Table 3 provides more detailed results for all items reported on by participating CMs.

Table 3: Summary of paired differences for Trafford SAP and GM-ELIAT (n = 5)

Paired Variable	***Mean Difference***	***95% CI***	***P-value***
Efficient assessment process	2.40	-0.46 to 5.26	0.080
Detailed assessment	2.80	0.96 to 4.64	0.013
Holistic assessment	2.00	-0.32 to 4.32	0.075
Addresses self-reported needs	2.20	-0.19 to 4.59	0.063
Clinical questionnaires add value	6.20	2.33 to 10.07	<0.001.
Automated functions enhanced quality	8.00	6.04 to 9.96	<0.001
Providing a quality assessment score	**23.20**	**12.08 to 34.32**	**0.004**
No repetition	4.40	2.51 to 6.49	0.003
Tick boxes speed the process	3.40	0.83 to 5.98	0.021
Minimal free text required	3.60	0.88 to 6.32	0.021
Automated functions speed the process	8.00	6.04 to 9.96	<0.001
Time efficiency Score	**19.40**	**13.67 to 25.13**	**0.001**
Clinical guidelines identify educational needs	6.40	2.42 to10.39	0.011
Clinical guidelines improve knowledge	6.40	2.42 to 10.39	0.011
Easy to access clinical guidelines	8.40	6.32 to 10.48	<0.001
Clinical guideline prompts guide practice	6.40	2.41 to 10.39	0.011
Educational tool score	**27.60**	**13.92 to 41.28**	**0.005**
Overall Score	**70.20**	**43.57 to 96.82**	**0.002**

9.7. Discussion

For all evaluation criteria CMs found the GM-ELIAT to be superior as an assessment tool than the Trafford SAP. The items showing the least differences were, providing an efficient assessment process and a holistic assessment; this is likely to be due to the Trafford SAP being designed to provide an efficient integrated assessment across community services, therefore, used correctly by all services this would be achieved. What the Trafford SAP does not possess, however, is the ability to provide instant communication between health and social care professionals, instant population of clinical and social information and instant referral pathways that the GM-ELIAT could potentially offer. Scores for items relating to the time it takes to complete assessments were considerably higher for the GM-ELIAT; higher scores were likely to be assisted by GM-ELIAT'S use of tick and multi-select boxes and the automatic functions that a paper-based form cannot provide. Items relating to the automatic functions for adding value to the assessment process such as

embedded questionnaires, calculations and interpretations revealed the greatest mean differences. Whilst the Trafford SAP relies on the experience and clinical expertise of the assessor to compensate for missing assessment criteria, the GM-ELIAT incorporates evidence based questionnaires that provide clinically relevant interpretations, to confirm the assessors own clinical judgement, or assist less experienced nurses in making clinical judgements. Fifteen of the 18 comparisons achieved a significant mean difference but because of the small number of cases (n=5) these values may be unreliable, therefore, have been presented in the table but not reported in the text. A more important indication of improvement was the direction and extent of the differences between the scores, and for this reason the 95% CIs have been reported.

9.8. Refinement

As previously reported, refinement was an ongoing process, but as the development stage of this project took nine months to complete the tool had undergone considerable refinement prior to testing, amendments were, therefore, minimal during the testing phase as described in 9.4 above. Other more major refinements that were made during the process came about as a result of feedback from other healthcare professionals including CMs from other services across Greater Manchester. Refinement involved, adding an Advanced Care Planning (ACP)[37] page and moving the End of Life[38] page to sit within this section. Advanced care planning has always been an intrinsic part of the NHS End of Life Programme but greater interest has prompted national guidance and local initiatives to develop ACP programmes. Within the tool, this page is very limited at present, but further wok will be carried out to expand the content. A separate page has been added for entering all investigations so that blood and other results could be entered at the same time rather than results only appearing with the system they relate to e.g. echocardiogram on the cardiovascular page and HbA1c on the endocrine and metabolic page. This allowed the assessment to flow better. Once entered on the investigations page, the results appear on the specific systems pages to activate clinical guidelines as appropriate. For the paper version of the GM-ELIAT, symptoms appear after each other under each system heading e.g. memory loss under cognitive needs and joint pain under musculoskeletal, the clinical assessment section then follows listing all clinical assessment items from each system page. For the electronic tool, clinic assessment lies within each system page. As the Trafford CMs said that they jumped from page to page at

times, a separate page will be created to collate all the clinical assessment items, once entered on the one clinical assessment page they will populate to the appropriate systems pages as per the investigation page.

For future refinement of the tool, it would be useful to have a steering group of health and social care professionals to provide advice on further refinement of the tool. Ideally the group would comprise of specialists and generalists from primary, secondary and community care settings. Members of the steering group could be accessed individually and as a group. To provide cohesion and encourage shared ownership of the process; their feedback would be shared across the group. This would assist in producing a standardised tool that would work across services and limit the difference of opinions that can arise from seeking feedback from individuals separately, as they are less likely to consider the impact of their suggestions on other services sharing the tool.

10. Limitations

The project was limited by the number of CMs we were able to recruit; this has resulted in an exceptionally small number of cases for analyses. Significant findings should be viewed with caution; yet CIs do provide relevant information about the size and direction of improvement in reported scores to be able to judge for feasibility of the GM-ELIAT in comparison to Trafford's existing assessment process. Due to the changes in advanced nursing community services in Trafford from June to November, and postponement of the pilot for several months, the testing period was dramatically reduced, however, maintaining regular contact with CMs and involving them in the refinement process meant that they retained up to date information regarding progress to allow them to provide informed views about the tool at the final evaluation even though their use had been relatively limited. It was a shame we could not recruit more CM services but as previously mentioned, the other CMs that we were in contact with were reluctant to test the tool due to other priorities and the additional paper work it would involve on top of already over laden caseloads. We were hoping to collect and analyse more qualitative data from group feedback at CM team meetings but unfortunately due to pressures on the CM service, team meetings were limited or used to discuss urgent internal issues regarding the service reconfiguration. There was also limited time between testing and submission of the evaluation

report for more meaningful qualitative analysis; this will be addressed in the main evaluation, however, when more time will be allocated for data collection and analysis.

11. Conclusions

This pilot project has provided a useful opportunity for an initial test of the functionality and feasibility of the GM-ELIAT. We were able to get a glimpse of the tool's acceptability across a clinical service. We have worked closely with the CMs throughout the process incorporating their views and their existing practices into the tool development to ensure that the GM-ELIAT is fit for purpose and accepted within a community matron service. The GM-ELIAT is totally different in many ways to the Trafford SAP yet is contains all the elements of the Trafford SAP and more, to provide a comprehensive assessment process, this is possibly one of the reasons that the GM-ELIAT has received such a positive evaluation from the Trafford CMs. Although the numbers involved in testing the tool has been extremely small, all CMs were very experienced advanced nurse practitioners with a breadth of knowledge of LTCs; their feedback has been invaluable in taking this project forward. The pilot has also proved useful in testing the evaluation process and the data collection methods. Reflections about the process and methods used will be synthesised prior to planning future projects.

12. Future Work

Work already in progress with regard to building the GM-ELIAT into clinical systems will continue and discussions with National Business Managers for the system companies; EMIS, Vision and SystmOne will recommence in preparation for building and re-testing the GM-ELIAT in a clinical system. This may increase the scope for recruitment if testing involves community services replacing their assessment process with the GM-ELIAT rather than being responsible for completing both. Talks will also continue with community services and integrated project teams such as Pennine Care, Stockport One and Salford Integrated Care for Older People to confirm commitment for taking this project to the next stage.

References

1. WHO. 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases: World Health Organization, 2008.
2. DoH. The NHS Outcomes Framework 2013/14. London: Department of Health, 2013.
3. DoH. LTC QIPP workstream London: Department of Health, 2011.
4. Bower P, Cartwright M, Hirani SP, Barlow J, Hendy J, Knapp M, et al. A comprehensive evaluation of the impact of telemonitoring in patients with long-term conditions and social care needs: protocol for the whole systems demonstrator cluster randomised trial. *BMC Health Serv Res* 2011;11:184.
5. Fortin M, Hudon C, Dubois MF, Almirall J, Lapointe L, Soubhi H. Comparative assessment of three different indices of multimorbidity for studies on health-related quality of life. *Health Qual Life Outcomes* 2005;3:74.
6. Poses RM, McClish DK, Smith WR, Bekes C, Scott WE. Prediction of survival of critically ill patients by admission comorbidity. *J Clin Epidemiol* 1996;49(7):743-7.
7. Tooth L, Hockey R, Byles J, Dobson A. Weighted multimorbidity indexes predicted mortality, health service use, and health-related quality of life in older women. *J Clin Epidemiol* 2008;61(2):151-9.
8. Wolff JL, Starfield B, Anderson G. Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Arch Intern Med* 2002;162(20):2269-76.
9. Rochon PA, Katz JN, Morrow LA, McGlinchey-Berroth R, Ahlquist MM, Sarkarati M, et al. Comorbid illness is associated with survival and length of hospital stay in patients with chronic disability. A prospective comparison of three comorbidity indices. *Med Care* 1996;34(11):1093-101.
10. Salisbury C, Johnson L, Purdy S, Valderas JM, Montgomery AA. Epidemiology and impact of multimorbidity in primary care: a retrospective cohort study. *Br J Gen Pract* 2011;61(582):e12-21.
11. Coventry PA, Hays R, Dickens C, Bundy C, Garrett C, Cherrington A, et al. Talking about depression: a qualitative study of barriers to managing depression in people with long term conditions in primary care. *BMC Fam Pract* 2011;12:10.
12. Dickens C, Coventry P, Khara A, Bower P, Mansell W, Bakerly ND. Perseverative negative cognitive processes are associated with depression in people with long-term conditions. *Chronic Illn* 2012;8(2):102-11.
13. Gagnon LM, Patten SB. Major depression and its association with long-term medical conditions. *Can J Psychiatry* 2002;47(2):149-52.
14. Haddad M. Caring for patients with long-term conditions and depression. *Nurs Stand* 2010;24(24):40-9; quiz 50.
15. Patten SB, Beck CA, Kassam A, Williams JV, Barbui C, Metz LM. Long-term medical conditions and major depression: strength of association for specific conditions in the general population. *Can J Psychiatry* 2005;50(4):195-202.
16. Spangenberg L, Forkmann T, Brahler E, Glaesmer H. The association of depression and multimorbidity in the elderly: implications for the assessment of depression. *Psychogeriatrics* 2011;11(4):227-34.
17. Albert NM. Improving medication adherence in chronic cardiovascular disease. *Crit Care Nurse* 2008;28(5):54-64; quiz 65.
18. Coleman CI, Roberts MS, Sobieraj DM, Lee S, Alam T, Kaur R. Effect of dosing frequency on chronic cardiovascular disease medication adherence. *Curr Med Res Opin* 2012;28(5):669-80.
19. Cooney D, Pascuzzi K. Polypharmacy in the elderly: focus on drug interactions and adherence in hypertension. *Clin Geriatr Med* 2009;25(2):221-33.
20. Sanchez-Gili M, Toro-Chico P, Perez-Encinas M, Gomez-Pedrero AM, Portoles-Perez JM. [Pharmaceutical intervention on the therapeutic adherence in patients with chronic renal disease]. *Rev Calid Asist* 2011;26(3):146-51.
21. Schmitt KE, Edie CF, Laflam P, Simbartl LA, Thakar CV. Adherence to antihypertensive agents and blood pressure control in chronic kidney disease. *Am J Nephrol* 2010;32(6):541-8.
22. Willey C, Redding C, Stafford J, Garfield F, Geletko S, Flanigan T, et al. Stages of change for adherence with medication regimens for chronic disease: development and validation of a measure. *Clin Ther* 2000;22(7):858-71.
23. Urquhart J. Pharmacoeconomic consequences of variable patient compliance with prescribed drug regimens. *Pharmacoeconomics* 1999;15(3):217-28.
24. Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet* 2012.
25. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005;83(3):457-502.
26. NHS Commissioning Board. Commissioning Outcomes Framework engagement document. available at http://www.commissioningboard.nhs.uk/files/2011/11/COF-final1.pdf ed: The NHS Commissioning Board Special Health Authority 2011:available at http://www.commissioningboard.nhs.uk/files/2011/11/COF-final1.pdf.
27. Quality guidelines and standards for genetic laboratories/clinics in prenatal diagnosis on fetal samples obtained by invasive procedures. An attempt to establish a common European framework for quality assessment. EUCROMIC Quality Assessment Group. *Eur J Hum Genet* 1997;5(6):342-50.
28. Healthier Together. Healthier Together: The Greater Manchester Vision: A review of health & care in Greater Manchester. Manchester, 2013.

29. Centre for Policy on Aging. Single assessment process- Moving towards a common assessment. London: Centre for policy on ageing (CPA) 2013.
30. DoH. Common Assessment Framework for Adults: Consultation on proposals to improve information sharing around multi-disciplinary assessment and care planning. In: Framework CA, editor. London: Department of Health, 2012.
31. Doggrell SA. Does intervention by an allied health professional discussing adherence to medicines improve this adherence in Type 2 diabetes? *Diabet Med* 2010;27(12):1341-9.
32. Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. *Am J Geriatr Pharmacother* 2007;5(4):345-51.
33. Haynes RB, Ackloo E, Sahota N, McDonald HP, Yao X. Interventions for enhancing medication adherence. *Cochrane Database Syst Rev* 2008(2):CD000011.
34. Camm AJ, Kirchhof P, Lip GYH, Schotten U, Savelieva I, Ernst S, et al. Guidelines for the management of atrial fibrillation *European Heart Journal* 2010;31:2369-429.
35. NICE. London National Institute for Health and Care Excellence, 2013.
36. NICE. Obesity- guidance on the prevention, identification, assessment and mangement of overweight and obesity in adults and children. CG.43. London National Institute for Health and Care Excellence., 2006.
37. DoH. Advanced Care Planning: A guide for Health and Social Care Staff. London: Department of Health, 2008.
38. DoH. End of Life Care Strategy: Promoting high quality care for all adults at the end of life. London: Department of Health, 2008.

Appendix 1

Version	Date	Work Progress /Additions/ Amendments
Paper/CHR TV1	01/09-06/12	Commenced tool development paper version-converted to electronic (Excel) then handed to TG for more complicated formatting
CHRT v1 CHRT v2 CHRT v3 CHRT v4 CHRT v5 CHRT v6 CHRT v7	06/12 to 09/12	**Stacked Sections:** Demographics, Medical Conditions, Physical Needs, Self reported needs not being met, Psychological Needs, Social Needs**,** Drug Allergies/sensitivities, Services involved, Functional status, Physical symptoms/needs, Patient enablement, Review details, Summary, Plan, **Sub sections in:** Further assessment, Plan, Physical needs sheets, Symptom review, Clinical examination, Pathology, Other investigations, Risk assessment, Clinical tools/evidence. **Section amendments/additions:** Indicators introduced, Comment boxes, Each section: separate sheets (display demographics name & ID), links **Reformatting:** Checkboxes replace drop down lists. create hidden rows, automating lists from a master list, displaying comments/guidance.
v1, v2, v3	11/12- 02/13	**Additional features:** Body Location using image mapping. **Development**: Summary sheet of data (on-going), in-built questionnaires using a variety of forms.
v4.2	03/13	**MY handed development to CO**
v4.3	03/13	**Corrections** (data) **Additions:** Wimbledon assessment and Further Symptoms. **Reformatting:** Summary Page **Expansion:** Demographics
v5.1 v5.2-3 v5.41-5	03/13	**Additions:** Medication. **Sub sections in:** Demographics, Medical history, List, Sections and Options, ADL page, Self-reported needs, Health& Social care decisions, Comments, Risk assessments, Pain and adherence. **Redesign:** ADL page, Social page, Tabs to Boxes (lists more medical conditions), Summary page: conditions to sections (all symptoms, all risk assessments), Test results split into separate page. **Section amendments:** eliminating duplicate values.
v6.1-5 v7.1-4	04/13 05/13	**Additions:** Spiritual Needs Page, Recreational drugs HCP correspondence page. **Sub sections:** Risk assessment to CKD diagnosis, Alcohol & Smoking sections to Medical history, Options to "NOK, Religion, Services, Physical activity to Self-reported need", Symptoms to Sensory page, Power of attorney to Social. **Expansions:** Demographics page, ADL (Options)**,** Assessment page (Key worker and access sections). **Redesign:** Care plan page. **Corrections:** Data and Codes. **Others:** Colour scheme: red to blue, locked sheets, altered code so compatible with Excel 2003, embedded PDF files replaced by Links
Pv1v2	05/13-07/13	**Printable paper version.** Implement changes from tool to paper version, Exploring possibilities and safety issues of laptop use,
v7.41-7.52	15/07/13	**Additions**: Clinical guidelines, Dementia assessments, Evaluation forms. **Re-design:** Care plan, Medication section for Dosage and Frequency. **Section amendments**: Organised bloods by type on Investigations. C**orrections:** Data and Code. **Others:** Defined Diabetes risk, Coded to go directly to Demographics page on opening, Print friendly Demographic, Assessment & Care Plan
Pv3.5	07/13	Implement changes to paper version from tool
v7.53-7.62	08/13	**Additions:** Demographics (Medication, Relationships, Services, Employment & Martial Status, Occupation and Further contacts), Care Plan (Spell check) , End of Life page. **Re-design**: medication section, split inhalers and nutritional to make more space
Pv3.6	11/09/	Paper version Implement changes from tool, correct spelling
v7.63	11/13	Implement feedback from testing, Care Plan re-formatted, Final evaluation Some common inhalers missing

Appendix 2: Electronic LTCs Integrated Assessment Tool (GM-ELIAT)

Paper version to be used in conjunction with electronic tool (test version)

Demographic Details

Surname

Preferred Name

First Name

NHS Number/Patient ID Age

Date of Birth Gender

Marital status Prev/ curr occupation

Employment situation (i.e. employed/ retired/ incapacitated/ carer etc)

Address

Ethnic Origin

Preferred spoken language

Interpreter **Required** Yes ☐ No ☐ **Booked** Yes ☐ No ☐

Religious/ belief affiliation

Does the person being assessed have any caring responsibilities? Yes ☐ No ☐

Details:

Registered GP incl GMC ref no

GP Practice address

GP email address

GP Phone no

Regular pharmacy

Address/ contact no of pharmacy

Next of Kin contact details

Relationship of Next of Kin to patient

Formal/Informal carer

Relationship of carer to patient Contact no

Representative/attorney/other

Relationship to patient Contact no

Personal information

Sexual orientation: Heterosexual ☐ Bisexual ☐ Lesbian/ Gay woman/ Gay man ☐ Prefer not to say ☐

Pregnant? Yes ☐ No ☐ Prefer not to say ☐

Verbal consent obtained?

For assessment? Yes ☐ No ☐ With limitations?

Obtained from? patient/ guardian

For sharing information? Yes ☐ No ☐ With limitations?

Obtained from? patient/ guardian

Does the patient agree to carers/ family members being asked views or being involved in their assessment?

Access

Any risk to staff visiting? (pets/ environmental issues. Give details)

How is access to the home obtained?

Permission to have key safe/ code? (include code)

Assessment Details

Key Professional Role

Contact details

Are you confident at this time that the person has capacity to make significant decisions? Yes ☐ No ☐

Referred by Role Date

Referral route Letter ☐ Phone ☐ Verbal ☐ Email ☐ Fax ☐ Other

Who is aware of the referral? Patient ☐ Family ☐ GP notification required? Done ☐

Others present Relationship

Others present Relationship

Assessment completed by Role

Sections completed

Date/ time Location

Assessment completed by Role

Sections completed

Date/ time Location

Medical History

Presenting problem(s)

Family medical history

Medical conditions

Age-related macular degeneration		Depression		ME	
Angina		Diabetes Type 1		Migraine	
Anxiety		Diabetes Type 2		MS	
Arthritis		Diabetic retinopathy		Osteoarthritis	
Asthma		DVT		Osteoporosis	
Atrial Fibrillation		Epilepsy		PAD	
Cataract		Fibromyalgia		Parkinson's disease	
CHD		Glaucoma		Peptic Ulcer	
CKD stages 3a		HF (LVSD)		Pernicious anaemia	
CKD stages 3b		HF (PEF)		Rheumatoid arthritis	
CKD stage 4		HF (right sided)		Rheumatic fever	
CKD stage 5		Hypercholesterolaemia		Schizophrenia	
Connective tissue disease		Hyperthyroidism		Stroke	
COPD		Hypertension		TB	
Chronic fatigue syndrome		Hypothyroidism		Thromboembolism	
Coronary Heart Disease		Ischaemic Heart Disease		TIA	
Dementia		Macula degeneration		Valvular Heart Disease	

Other:

Past surgery/procedures

Above knee amputation		Chemotherapy		Mastectomy R/L	
Angioplasty		Endarterectomy		Pacemaker fitted	
Aortobifemoral bypass		Femoropopliteal bypass		Rectal prolapse repair	
Below knee amputation		Femoral-tibial bypass		Prostatectomy	
CABG		Hiatus hernia repair		Radiotherapy	
Cardioversion		Hip arthroplasty		Uterine prolapse repair	
Cataract surgery		Inguinal hernia repair		Vaginal prolapse repair	
Cholecyctectomy		Knee arthroplasty			

Other:

Medication

Regular medication **(nutritional supplements can be entered under Endocrine & Metabolic section)**

Name	Dose/Frequency	Name	Dose/Frequency

PRN medication

Name	Dose/Frequency	Name	Dose/Frequency

Vaccines

Seasonal Influenza < 12mths ago ☐ >12mths ago ☐ Contraindicated ☐ Refused ☐
Not recorded ☐

Pneumococcal < 12mths ago ☐ >12mths ago ☐ Contraindicated ☐ Refused ☐
Not recorded ☐

Shingles < 12mths ago ☐ >12mths ago ☐ Contraindicated ☐ Refused ☐
Not recorded ☐

Allergies/ intolerances/ sensitivities

Yes ☐ (please give details below) No ☐

Alcohol/ Tobacco

Alcohol consumption Yes ☐ → Audit-C completed ☐ Never ☐ No longer ☐ Alcoholic? ☐

Units pr week ☐ Abstained for? ☐

Tobacco use Never smoked ☐ (go to drug use) Ex-smoker ☐ Smoker ☐

Tobacco type and number of years ☐

Current recreational drug use Yes ☐ (please give details below) No ☐

Previous recreational drug use Yes ☐ (please give details below) No ☐

Section 2: Current Support

Has the patient attended hospital in the last 6 months? Yes ☐ No ☐

Which hospital and what was the reason for the admission?

Section 2: Current Support cont..

Care arrangements (who currently manages care? Tick all that apply)

Patient ☐ Informal carer ☐ Formal carer(s) ☐

Has carer's views been taken into account?

Yes ☐ No ☐

Healthcare professionals/services currently involved in care

		None ☐

Social care services currently involved in care

		None ☐

Section 3: Self reported needs

Health or social needs

Patient's perception of own health

Self monitoring readings; most recent

BP		Date		**BP**		Date	
BM		Date		**BM**		Date	
Weight		Date		**Weight**		Date	

Important aspects of life/ hobbies

Physical activity

Type of activity

Frequency/ week

Average duration

Need identified ☐

Personal strengths

Making decisions about healthcare

Independently makes decisions ☐ Fully supported making decisions ☐ Needs support to make decisions ☐

Support needed to make decisions related to:

Attending a day centre ☐	Implementing dietary advice ☐	Learning opportunities ☐
Attending exercise classes ☐	Implementing exercise advice ☐	Reducing alcohol intake ☐
Benefits ☐	Job opportunities ☐	Stopping recreational drugs ☐
Finance ☐	Joining a social club ☐	Stopping smoking ☐
Housing ☐	Joining a support group ☐	Taking medicines ☐
Other ☐	☐	☐

Section 3: Self reported needs cont..

Health goal (1)

Date to achieve by

What steps do you think you will need to take to achieve your goal?

1
2
3
4

How will achievement be celebrated ?

Health goal (2)

Date to achieve by

What steps do you think you will need to take to achieve your goal?

1
2
3
4

How will achievement be celebrated ?

Section 5: Physical Needs/ Symptoms

Cardiovascular

Shortness of breath (SOB)
Chest tightness
Chest pain
Orthopnoea
PND
Palpitations
Dizziness
Syncope
Claudication
Fatigue
Sexual dysfunction

NYHA Classification (HF diagnosis only)

SOB triggered by:
- Allergens
- Temperature
- Smoke
- Medicines
- Chemicals
- Emotions
- Exertion

SOB relieved by:
- Rest
- Sitting up
- Fresh air
- Inhaler
- Medication

Endocrine and Metabolic

Recent hypoglycaemia
Recent hyperglycaemia (diabetes diagnosis only)
Dysphagia
Loss of appetite
Blurred vision
No nutrition for 5 days
Perenteral nutrition
Recent unplanned weight loss
Enteral nutrition
Fruity odour
Weight loss (kg)
Dry, itchy skin
Thin, brittle fingernails
Terminal cachexia
Intolerance to cold
Heavy menstrual periods
IV infusion
GI hypermotility
Poor concentration
Muscle cramps
Light, irregular periods
Irritability
Hair thinning, loss
Intolerance to heat
Insomnia
Hand tremors
Excessive thirst
Increased perspiration
Fine brittle hair
Recent weight gain
Numbness
Slow wound healing
Difficulty losing weight

Section 5: Physical Needs/ Symptoms cont..

Nutritional Supplements	Dose/Freq/ Adm	Nutritional Supplements	Dose/Frequency/ Adm

Respiratory

SOB (see cardiovascular) ☐ MRC Grade ☐ (COPD diagnosis only)

Chest tightness ☐ Frequent winter bronchitis ☐ Childhood asthma ☐

Cough ☐ Haemoptysis ☐ F/H of asthma ☐

Sputum/ colour ☐ Orthopnoea ☐

Prev diagnosis of asthma ☐ → ACT completed to determine control ☐

COPD diagnosed/suspected ☐ → CAT completed to determine impact on daily living ☐

Musculoskeletal

Joint pain ☐ Muscle pain ☐ Tendon pain ☐ → Complete BPI/ Abbey pain scale

Pain located in ☐ ☐ ☐

☐ ☐ ☐

Chronic pain ☐ Acute pain ☐ Acute on chronic pain ☐ Duration (weeks) ☐

Description of pain (muscular) ☐

Joint stiffness ☐

Joint weakness ☐

Joint deformity ☐

Muscle weakness ☐

Muscle stiffness ☐

Poor manual dexterity ☐

Muscular pain relieved by:

Medication ☐ Rest ☐

Heat therapy ☐ Physiotherapy ☐

Cold compress ☐ Exercise ☐

Elevation ☐ Alt. therapy ☐

BPI 'Pain Severity' completed ☐ BPI 'Pain Interference' completed ☐ Abbey completed ☐

Neurological

Blackouts ☐ Fits ☐ Seizures ☐

Balance problems ☐ Poor gait ☐ Fall in last 12 months ☐

Tremor ☐ Bradykinesia ☐ Mask like expression ☐

Aphasia ☐ Apraxia ☐ Dysphagia ☐

Dizziness ☐ Syncope ☐ Dysarthria ☐

Abnormal sleep pattern ☐

Sensory impairment ☐ → Further TIA/Stroke assessment (see sensory) ☐

Falls risk ☐ → Further FRAT assessment ☐

Pain/altered sensation ☐ → LANNS completed to confirm whether pain is neurological ☐

Pain located in ☐ ☐ ☐

☐ ☐ ☐

Description of pain (neurological) ☐

Section 5: Physical Needs/ Symptoms cont..

Neurological pain relieved by:

Medication	☐	Elevation	☐	Exercise	☐
Heat therapy	☐	Rest	☐	Alt. therapy	☐
Cold compress	☐	Physiotherapy	☐		

Cognitive

Poor memory	☐	Poor concentration	☐	Disorientation	☐
Confusion	☐	Poor attention span	☐	Poor orientation	☐
Abnormal sleep pattern	☐				

Cognitive impairment suspected ☐ → GPCOG/ 6CIT/ DemTect completed to confirm ☐

Mental state (Moving & handling score)	Fully co-operative	☐	Aggressive	☐	Uncooperative	☐	Unpredictable ☐
	Poor understanding	☐	Sedated	☐	Unconscious	☐	

Sensory

Visual impairment	☐	Partially sighted or blind	☐	Prostheses	☐
Glasses/ lenses worn effectively	☐	Glasses/ lenses ineffective	☐	Glasses/ lenses not worn	☐
Vision interferes with reading	☐	Vision interferes with ADL	☐	Vision affects social activities	☐
Hearing impairment	☐	Deaf or partially deaf	☐	Hearing affects social activities	☐
Hearing aid worn	☐	Hearing aid ineffective	☐	Hearing interferes with ADL	☐
Sensory impairment	☐	Balance problems	☐	Last hearing test > 18 months?	☐
Dysphagia	☐	Impaired dexterity	☐		
Communication impairment	☐	Aphasia	☐	Apraxia	☐
Dysarthria	☐	Difficulty expressing self	☐	Difficulty understanding others	☐
Difficulty being understood	☐	Communicates with pictures	☐	Difficulty using telephone	☐
Distressed by impaired communication	☐				

Urological

Urge to pass urine	☐	Passes urine ≥7 times 24hrs	☐	Passes urine at night	☐
Leak with strong urge	☐	Burning on micturition	☐		
Leak on laugh/cough/sneeze	☐	Leak after micturition finished	☐	Difficulty passing urine	☐
Difficulty initiating micturition	☐	Straining to pass urine	☐	Poor stream	☐
Dribble without warning	☐	Continued leak after micturition	☐	Leak no warning/sensation	☐

Gastrointestinal

Bowel problems	☐	Change in bowel habit	☐	Constipation	☐
Indigestion	☐	Diarrhoea	☐	Haemorrhoids	☐
Dysphagia	☐	GI hypermotility	☐	Pain on defaecation	☐
Nausea	☐	Urge to defaecate	☐	Incomplete emptying	☐
Vomiting	☐	Faecal incontinence	☐	Soiling	☐
Abdominal pain	☐	PR bleeding	☐	Passing mucous	☐
Haematemesis	☐	Malaena	☐		

Continence equipment:

Section 5: Physical Needs/ Symptoms cont..

Tissue Viability

Tissue Viability risk ☐ Eczema ☐ Psoriasis ☐ Tissue irritation ☐

Location of skin disorder

Tissue viability equipment:

Other symptoms observed:

Activities of Daily Living

Key:

need identified	A	independent with equipment	D
needs assistance, but full physical support provided	B	needs assistance, but manages with verbal support	E
independent	C	does not wish to attend	F

Needs at home:	Key:	Observed	Discussed	**Needs away from home:**	Key:	Observed	Discussed
Mobility				Mobility			
Transfer				Shopping			
Stairs				Attending family/ friends social events			
Bathing							
Washing				Attending hospital/ clinic appointments			
Oral hygiene							
Dressing				Attending social clubs/ community centres			
Grooming							
Footcare				Attending place of worship			
Food preparation				Attending the library			
Feeding				Attending support groups			
Housework							
Laundry							
Toilet Use							
Bladder				None ☐ occasional leak ☐ frequent leak ☐ catheterised ☐			
Bowels				incontinent ☐ soiling ☐ regular enemas ☐			
Hobbies							

ADL equipment details:

Section 5: Clinical Examination

Cardiovascular

Pulse: rate ☐ | Systolic BP ☐ | Foot pulses ☐
Pulse: rhythm ☐ | Diastolic BP ☐ | Peripheral oedema ☐
Abnormal heart sounds ☐ | Postural hypotension ☐ | Ankle oedema ☐
JVP ☐

Endocrine and Metabolic

Height (m) ☐ | Weight (kg) ☐ | Waist circumference (cm) ☐
Absent foot pulses ☐ | Abnormal foot sensation ☐ | Foot deformity ☐
Unsuitable footwear ☐ | Jaundiced ☐ | Foot ulceration ☐

Respiratory

RR ☐ | Peripheral oedema ☐ | Percussion ☐
Temp (°C) ☐ | Pulmonary oedema ☐ | Tracheal deviation ☐
Added breath sounds ☐ | Chest expansion ☐ | Pallor ☐
Stridor ☐ | Crackles ☐ | Wheeze ☐
Cyanosed ☐ | Breath sounds ☐ | Using accessory muscles ☐

Musculoskeletal

Crepitus ☐ | Synovitis ☐ | Myositis ☐
Joint Inflammation ☐ | Tendonitis ☐

Neurological

Difficulty rising from sitting ☐ | Postural hypotension ☐ | SD ≥ 20/DD ≥ 10 mmHg ☐
Unsteady walking while talking ☐ | Sways on standing ☐ | Failed 'timed up and go' test ☐
Drowsy ☐ | Pupils equal reactive ☐ | Confused ☐

Urological

Pelvic floor examination ☐

Gastrointestinal

Abdomen distended ☐ | Abdomen tender ☐ | Abdomen soft ☐
Normal bowel sounds ☐ | Palpable mass ☐ | Percussion ☐
PR ☐ | Rectal prolapse ☐

Tissue viability

Skin redness ☐ | Tissue loss ☐ | Rash ☐
Peripheral Oedema ☐ | Ulceration ☐ | Gangrene ☐
Acites ☐ | Skin type ☐

Mobility (Waterlow and moving & handling score)

Fully ☐ | Restless/ Fidgety ☐ | Apathetic ☐ | Restricted ☐
Bedbound e.g. traction ☐ | Chairbound e.g. wheelchair ☐

Section 4: Other Investigations

Proteinuria (dipstick)		BM	
Nitrites (dipstick)		LVEF	
Haematuria (dipstick)		FEV1	
Glucose (dipstick)		FEV1%	
Leucocytes (dipstick)		SATs % with air	
Ketones (dipstick)		SATs % with O2	
MSU sample collected	☐	Stool sample collected	☐

Last optometry examination Stable ☐ Worsening ☐ Date

Section 7: Psychological Needs

Anxiety/ Depression

Anxiety	☐	Stress	☐	Feeling down/ depressed	☐
Irritability	☐	Fatigue	☐	Little interest, pleasure in activities	☐
Insomnia	☐	Difficulty coping with LTCs	☐	Reaction to loss/ bereavement	☐
Normal mood	☐	Low mood	☐	Mood swings	☐
Poor motivation	☐	No interest in others	☐	No interest in surroundings	☐
Sexual dysfunction	☐	Relationship problems	☐	Obsessive-compulsive behaviour	☐
Impulsive behaviour	☐	Addictive behaviour	☐	Antisocial behaviour	☐
Eating/ weight issues	☐	Phobia	☐	Delusions	☐
Hallucinations	☐	Paranoia	☐		
At risk to self/ self harming	☐	At risk to others	☐		

Depression suspected ☐ → PHQ 9/ GAD 7/ Wimbledon completed ☐ HAD assessment completed ☐

Tachycardia ☐ Sweating ☐

Section 8: Social needs

Social circumstances

Accommodation

Tenure	Council ☐		Owner occupied ☐		Privately rented ☐		Housing association ☐		
Housing	House ☐		Bungalow ☐		Apartment (GF) ☐		Apartment (above GF) ☐		
Accommodation access			Ground floor ☐		Uses stairs ☐		Uses lift ☐		
Internal access	Stairs ☐ →	1 rail ☐	2 rails ☐		None ☐		Stair lift ☐	Lift ☐	
Bedroom access	Same level as living area ☐		Uses stairs ☐		Uses lift ☐				
WC access	Same level as living area ☐		Uses stairs ☐		Uses lift ☐				
Bathroom access	Same level as living area ☐		Uses stairs ☐		Uses lift ☐				
Home environment	All amenities available ☐		Modified to suit needs ☐		Needs modification ☐				
Heating	Fully adequate ☐		Partially adequate ☐		Need identified ☐				
Living arrangement	lives with:								
Fire safety	Smoke alarm fitted ☐								

Managing social affairs

Collecting prescriptions	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐				
Finances	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐				
Finding employment	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐		N/a ☐		
Education	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐		N/a ☐		
Benefits	In receipt of benefits ☐		Unsure if benefits received ☐						
Benefits assessments	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐		N/a ☐		
Home safety	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐				
Emotional support	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐				
Companionship	Independent ☐		Needs assistance, fully supported ☐		Need identified ☐				
Power of attorney	Not required ☐		Has a registered Lasting POA ☐		Need identified ☐				
Informal carer	Able to provide physical and emotional support ☐								
Need identified: Unable to provide complete	physical support ☐		emotional/ psychological support ☐						

Safeguarding

Does the patient have significant contact with children or vulnerable adults? Yes ☐ No ☐ Unknown ☐

Are there any concerns? Yes ☐ No ☐

If yes, please give details:

Section 10: Adherence to therapy

Adherence barriers	Never	Rarely	Sometimes	Often	Always
Difficulty reading medicine labels	☐	☐	☐	☐	☐
Difficulty opening medicines	☐	☐	☐	☐	☐
Difficulty collecting prescriptions	☐	☐	☐	☐	☐
Difficulty taking medicines	☐	☐	☐	☐	☐
Forgets to take medicines	☐	☐	☐	☐	☐
Troubled by side effects	☐	☐	☐	☐	☐
Needs prompting to take medicines	☐	☐	☐	☐	☐
Needs assistance to take medicines	☐	☐	☐	☐	☐
Alters doses	☐	☐	☐	☐	☐
Takes less than instructed	☐	☐	☐	☐	☐
Misses doses out	☐	☐	☐	☐	☐
Stops taking them for a while	☐	☐	☐	☐	☐

Uses adherence aids? Blister packs ☐ Pill organiser ☐ Alarm clock ☐ Text reminders ☐ Phone call reminders ☐

Section 14: Patient enablement

As a result of this assessment and the support and advice you have been given to manage your long-term conditions do you feel that you are.....	Much better	Better	Same or less	N/A
Able to cope with life	☐	☐	☐	☐
Able to understand long term conditions	☐	☐	☐	☐
Able to cope with long term conditions	☐	☐	☐	☐
Able to keep yourself healthy	☐	☐	☐	☐
Confident about health	☐	☐	☐	☐
Able to help yourself	☐	☐	☐	☐

Section 11: Summary

Physical Needs: Symptom Review

Clinical examination

Psychological Needs

Social Needs

Section 12: Care Plan

Physical/Psychological/Social Need

Action Required

Expected Outcome

Refer to **Referral Date**

Review date

Physical/Psychological/Social Need

Action Required

Expected Outcome

Refer to **Referral Date**

Review date

Physical/Psychological/Social Need

Action Required

Expected Outcome

Refer to **Referral Date**

Review date

Physical/Psychological/Social Need

Action Required

Expected Outcome

Refer to **Referral Date**

Review date

Physical/Psychological/Social Need

Action Required

Expected Outcome

Refer to **Referral Date**

Review date

Appendix 3

Electronic LTCs Integrated Assessment Tool (GM-ELIAT)

User guide: Trafford Community Matron Service

1. **To get started**, click on enable macos when you open the excel file and then 'Save as', enter a unique name (such as LTC test 1 then add your initials and the patients initials) and save in the folder named LTC tool which can be found on the shared drive within the community matrons folder. You will see a file called 'master' within the LTC tool folder. This is a blank version that can be opened and renamed each time you conduct a new assessment.

2. **To navigate through the tool** there is a menu to the left of every section, simply click on the desired section. Sometimes the tool takes a while to open the desired page if you are clicking through sections quickly. All the forms are found at the top of the page so if the screen appears blank or you see a table with text and codes in just scroll up to the top of the page to find the form. Some sections of the tool are not ready for use, 'End of Life' and 'Spiritual Needs', so please leave these sections blank.

3. There is a combination of **free text boxes and drop down boxes** on each page. If you click on any white box it will either allow you to add free text or reveal a drop down box with options for you to choose from.

4. Please complete the **demographic details and medical history** page before going onto the individual systems pages in the physical needs section as information within these sections e.g. age, medical conditions, alcohol and smoking status are used to automatically calculate health risks found in the Risk assessment section at the bottom of each page. Other details such as **height, weight and waist circumference** found on the endocrine and metabolic page, **skin type** found on the tissue viability page and **mental state** found on the cognitive page are used to calculate scores such as BMI, MUST, Waterlow and Moving and Handling so it is important that the tool is completed fully to ensure that the calculations appear and are accurate.

5. **Test results can only be entered into the Investigations page** (section 4). Once entered they will appear on the individual section pages to calculate health risks. Use the left hand column to enter the most recent as this is the value that will appear on the relevant section page in the pathology and other investigations sections (apart from eGFR which relies on 3 readings to confirm a diagnosis). The following values activate risks and comment boxes:

a. eGFR, one reading <60 will add CKD risk on cardiovascular page. A further two readings <60 will confirm diagnosis and calculate the stage.
b. ACR and PCR will add proteinuria as a risk if present to the CKD stage
c. HbA1c, FPG and OGTT will highlight a diabetes risk or confirm diagnosis
d. LVEF provides the EF reading on the risk assessment section on the cardiovascular page
e. MSU if positive UTI will appear on the bladder page

Let me know if there are other abnormal values that you would like to be used to calculate health risks.

6. There are **small red triangles** in the upper right corner of some cells that describe abbreviations and can be read by hovering over them with the cursor.

7. Each page within the physical needs section follows a standard format, symptoms, clinical examination, pathology and other investigations (can only be filled in on the investigations page), risk assessment and further details/comments. All symptoms have **drop down boxes** and most response options are yes/no. You **do not need to fill in 'No' for all non-relevant symptoms** you can just leave these blank. Only the yes responses will appear on the summary page. Add any further descriptions of symptoms or any further information to the further details/comments box.

8. If there are symptoms, clinical examinations, **information missing or any faults** with the tool please let us know by adding a comment in the further details/comments box.

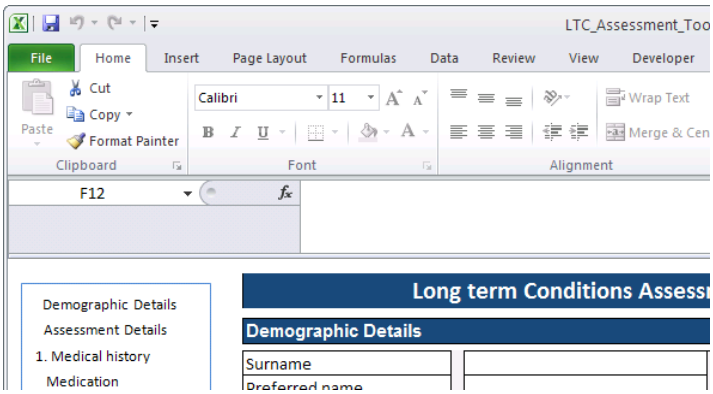
9. After making a selection in a drop down box or entering a value, the box will turn dark grey. You can add symptoms not listed in the extra boxes, more lines will appear if there are more than three in each section. Many fields are hidden until required, **use the Enter or Tab key to activate hidden fields. Questionnaires** are activated by clicking on them in the Risk Assessment section. Fields which are automatically populated are locked and cannot be edited.

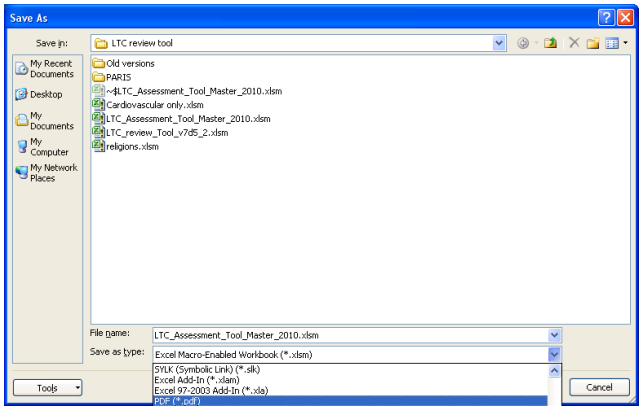
10. **Clinical information appears in dark blue comment boxes** on the right hand side of the form. If you hover over the information sign ⓘ the information will appear but many are automatically activated when certain symptoms, clinical examination or investigations are completed.

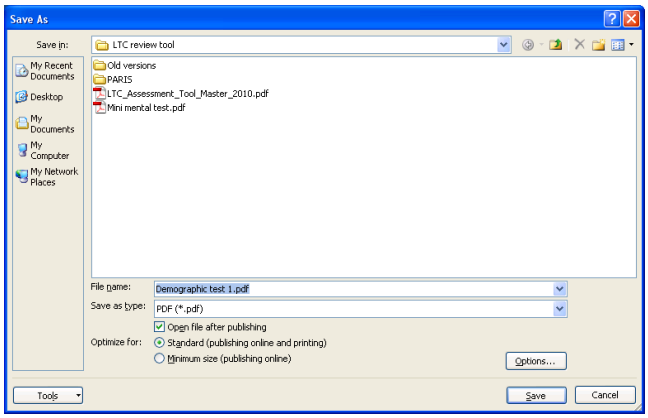
11. The **summary section will collate the information** entered in the tool and all the associated risk factors. This may take a several seconds to activate, particularly if there is a lot of information to collate. Only the patient's name, ID number and consent details appear on the summary from the demographic page and none of the information from the assessment details appear on the summary.

12. For testing purposes the **care plan page does not contain any predetermined information** generated by the assessment as yet. **Please complete using free text** as you would do with your current SAP as this will assist us to develop this page with automated information.

13. Certain pages have been set up for you to save and print out for your records, to send to the patient's GP or to keep a copy in the patients SAP folder. These pages are: **Demographic details, Assessment details, Summary and Care Plan.** The summary page should contain all the relevant information that you have inputted and therefore, you shouldn't need any other information from the individual pages. If you find any sections missing from the summary then please let me know. **You can save the pages mentioned above as PDFs if you are using excel 2007 or 2010.** Select the 'File' tab, select 'Save as', pick a suitable location and file name, select 'PDF' from the drop down box and select 'Save' (see screen shots below). These can then be printed out. If you are intending to keep them as saved files please ensure that you comply with your community Trust's data protection policy.

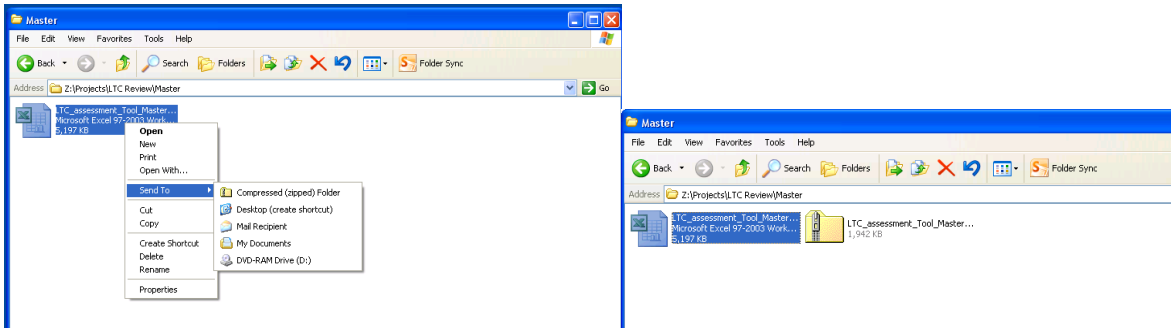






14. **For sequence two** (completing a the paper version in the patients house then completing the electronic version back in the office), please complete the **Patient Enablement** with the patient once the assessment and care plan is complete as this will assist the evaluation.

15. After each completed assessment make sure you have **printed out the relevant sections** e.g. summary and care plan (demographic and assessment pages if needed). Remove or do not input patient's name, address, NOK and informal carer's name if you already have a copy of these on the paper version. **Save** (make sure it is saved with a unique name as in point 1. **Do not save it as 'master'**) then **close the file.** Right-click on the file icon, select "Send To..", then "Compressed (zipped) Folder". This will create a folder with the same name, but different icon (see screen shots below). Please **send the new folder to Trish Gray**. You can then delete this file from your computer as long as you have a paper version for your records.



16. For your next assessment, go to the 'master' file saved on the shared network under 'Community Matrons' and save a copy as in point 1 above you can then begin a new assessment.

17. If you have any difficulties using the assessment tool please don't hesitate to contact one of us at any time by email or telephone (see contact details below).

Trish Gray
Knowledge Transfer Research Fellow
Email: Trish.Gray@manchester.ac.uk
Tel: 0161 206 1587
Mob: 07827 308810

Caroline O'Donnell
Data Analyst
Email: Caroline.ODonnell@srft.nhs.uk
Tel: 0161 206 1589

Appendix 4

Electronic LTCs Integrated Assessment Tool (GM-ELIAT)
Baseline Evaluation

Name _____

Role _____ **Date** _____

1 On average, how long does it take in total to complete a new patient assessment using the current Trafford Single Assessment Process (SAP)?

_____ Hours

2 On average how many consultations are required to complete one assessment?

_____ Consultations

3 Does the current SAP involve repetition of recorded information?

Yes (please provide details) ☐ No ☐

_____

4 Do you obtain information from the patient's GP records prior to commencing the assessment?

Yes ☐ No (go to Q5) ☐

4a What details do you obtain?

Demographics	☐	Medical history	☐	Medication	☐
Allergies	☐	Referral history	☐	Social status	☐
Current support	☐	Other (provide details below)	☐		

_____

4b How is this information obtained?

Print out	☐	Copied by hand	☐	Fax	☐
Telephone	☐	Email	☐	Other	☐

_____

4c On average, how long does it take to obtain this information?

hours ☐ mins ☐

5 Are you required to update GP system records following a patient assessment?

Yes ☐ No (go to Q6) ☐

5a What do you update?

_____

5b How long does this take?

hours ☐ mins ☐

6 Do you obtain information from the patient's hospital EPR prior to commencing the assessment?

Yes ☐ No (go to Q7) ☐

6a What details do you obtain?

Demographics	☐	Medical history	☐	Medication	☐
Allergies	☐	Referral history	☐	Social status	☐
Current support	☐	Other (provide details below)	☐		

6b How is this information obtained?

Print out	☐	Copied by hand	☐	Fax	☐
Telephone	☐	Email	☐	Other	☐

6c On average, how long does it take to obtain this information?

hours ☐ mins ☐

7 Is there anything else you have to do as part of the assessment process that lenghens the time it takes to complete an assessment?

Yes (please provide details) ☐ No (go to Q8) ☐

8 Does the current Trafford SAP contain sufficient assessment criteria to allow you to complete a detailed assessment without using your experience to add questions/examinations?

Yes ☐ No (please provide details) ☐

Trish Gray

Knowledge Transfer Research Fellow

June 2013

Appendix 5

Electronic LTCs Integrated Assessment Tool (GM-ELIAT)
Evaluation: Sequence 1

Name _____

Role _____ **Date** _____

1 **Is this the first time you have transferred assessment information from an existing assessment to the electronic assessment tool?**

Yes (go to Q2) ☐ No ☐

1a **How many have you completed?** _____

2 **How long did it take to transfer the information from the SAP to the electronic tool?**

☐ hours ☐ mins

3 **Did you find the sections within the electronic assessment tool to be presented in a logical order?**

Yes (go to Q4) ☐ No ☐

3a **How could this be improved?**

4 **Did you easily find the sections you needed?**

Yes (go to Q5) ☐ No ☐

4a **How could this be improved?**

5 **Where you able to transfer all the assessment information you had entered on your current forms to the electronic tool for this assessment?**

Yes (go to Q6) ☐ No ☐

5a **Have you made a note of missing information in the further details/comments section on the relevant page?**

Yes (go to Q6) ☐ No ☐

5b **What information was missing?**

6 Was there anything missing from the multiple option boxes on the right hand side of the form for this assessment?

Yes ☐ No (go to Q7) ☐

6a Did you make a note of missing information in the further details/comments section on the relevant page?

Yes (go to Q7) ☐ No ☐

6b What information was missing?

7 Was there anything missing from the drop down boxes for this assessment?

Yes ☐ No (go to Q8) ☐

7a Did you make a note of missing information in the further details/comments section on the relevant page?

Yes (go to Q8) ☐ No ☐

7b What information was missing?

8 Did the tool produce any additional useful information not already gathered by your current forms for this assessment?

Yes ☐ No (go to Q9) ☐

8a What additional useful information?

More detailed:

Cardiovascular assessment	☐	Bladder assessment	☐	Health questionnaires	☐
Respiratory assessment	☐	Bowel assessment	☐	Identification of health risks	☐
Endocrine/metabolic assessment	☐	Tissue viability assessment	☐	Self-reported needs	☐
Musculoskeletal assessment	☐	ADL assessment	☐	Adherence assessment	☐
Cognitive assessment	☐	Social care assessment	☐	Prompts	☐
Neurological assessment	☐	ID of new diagnoses	☐	Qu score calculations?	☐
Sensory assessment	☐	Quick links to clinical evidence	☐	Qu score interpretations?	☐

Other/please provide more details

9 Did the summary produce similar information to what you had written on your current assessment summary?

Yes (go to Q10) ☐ No ☐

9a What was different?

10 Do you think that the summary produced by the tool enhanced the assessment process for this assessment?

Yes ☐ No (go to Q10b) ☐

10a How did it enhance the process?

10b How could this be improved?

11 Did the summary produce any irrelevant information not required for this assessment?

Yes ☐ No (go to Q12) ☐

11a What irrelevant information?

12 Did you complete the care plan?

Yes ☐ No (end of questionnaire) ☐

12a Did the care plan contain all the sections you needed to assist you in developing a comprehensive care plan for this assessment?

Yes (go to 12c) ☐ No ☐

12c What was missing from this page?

Thank you for completing the evaluation questionnaire

Trish Gray
Knowledge Transfer Research Fellow
June 2013

Appendix 6

Electronic LTCs Integrated Assessment Tool (GM-ELIAT)
Final Evaluation

Name _____

Role _____ **Date** _____

1 **On average, how long did it take to complete a new patient assessment using the GM-ELIAT?**
_____ mins

2 **On average, how many consultations were required to complete one assessment?**
_____ Consultations

3 **Please score the Trafford SAP and the ELIAT using a scale or 0-10 for the following items**

3a **Provides an efficient assessment process**
Trafford SAP _____ ELIAT _____

3b **Provides a detailed assessment without having to use clinical experience to add assessment criteria**
Trafford SAP _____ ELIAT _____

3c **Provides a holistic assessment by incorporating detailed social and psychological needs as well as physical needs**
Trafford SAP _____ ELIAT _____

3d **Addresses patient's self reported needs**
Trafford SAP _____ ELIAT _____

3e **There is no need to repeat information to provide a comprehensvie assessment**
Trafford SAP _____ ELIAT _____

3f **Tick boxes speed the process whilst providing enough detail**
Trafford SAP _____ ELIAT _____

3g **The amount of text is reduced to a minimum by the use of tick boxes and multi-select boxes**
Trafford SAP _____ ELIAT _____

3h **Automated score calculations and interpretations provide clinically relevant information to enhance the quality of the assessment**
Trafford SAP _____ ELIAT _____

3i **Automated score calculations and interpretations speed the process**
Trafford SAP _____ ELIAT _____

3j **Clinical questionnaires added value to the assessment**

Trafford SAP ☐ ELIAT ☐

3k **Cinical guideline prompts assist in guiding practice for less experienced HCPs**

Trafford SAP ☐ ELIAT ☐

3l **Clinical guideline prompts assist in identifying educational needs for less experienced HCPs**

Trafford SAP ☐ ELIAT ☐

3m **Clinical guideline prompts assist in improving knowledge of LTCs for less experienced HCPs**

Trafford SAP ☐ ELIAT ☐

3n **Links to clinical documents provide easy access for checking the latest clinical guidance if required, before making clinical decisions**

Trafford SAP ☐ ELIAT ☐

3o **Enhances/Could enhance integrated care across services (primary/secondary care and community) by providing instant sharing patient of needs and clinical practice**

Trafford SAP ☐ ELIAT ☐

Trish Gray

Knowledge Transfer Research Fellow

Nov 2013