

Report for Health Workforce New Zealand

UCOL Evaluation Report



Establishment of Clinical Exercise Physiologist in New Zealand / Developing Health Career Pathways

**December 2014
Final Report**

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Executive Summary

UCOL would like to acknowledge the support of Health Workforce New Zealand for our Clinical Exercise Physiology initiative here at UCOL. Without the support of Health Workforce New Zealand, MidCentral DHB, Central PHO and TBI Health this initiative would have not have been possible.

UCOL became a demonstration site in 2012 with the aim to showcase how Clinical Exercise Physiologists can help rehabilitate people with chronic conditions, and encourage exercise science students to consider this career. A Clinical Exercise Physiologist can be defined as a qualified allied health professional who specialises in clinical exercise interventions for persons at high risk of developing, or with existing chronic and complex medical conditions and injuries¹. This includes the provision of individualised and specialised exercise testing and training for clients with conditions such as cardiovascular disease, diabetes, respiratory conditions, while ensuring client safety through monitoring and supervision, along with appropriate exercise prescription based on exercise testing results and responses.

This project is divided into three components: (1) Provision of Clinical Exercise Physiology services at the UCOL U-Kinetics *Te Huinga Waiora* Centre; (2) Showcasing the Role of the Clinical Exercise Physiologist in Aged Care; and (3) Initiatives based around Career Pathways to Clinical Exercise Physiology and Health, including the UCOL Health Academy.

1. Clinical Exercise Physiology Services

In 2012, UCOL established the Postgraduate Diploma in Clinical Exercise Physiology and also set up U-Kinetics *Te Huinga Waiora*, an Exercise and Wellness Clinic to provide the clinical exercise physiology learning for the Postgraduate programme. U-Kinetics was established in collaboration with MidCentral DHB, Central PHO and TBI Health. As part of the Postgraduate programme, students must gain over 540 hours of clinical exercise delivery across the following areas: (1) cardiovascular or metabolic conditions; (2) Respiratory or Neurological conditions, or Cancer, and (3) Musculoskeletal injuries or conditions; while having the potential to work with clients with other conditions. A total of 31 students have now graduated with the Postgraduate Diploma in Clinical Exercise Physiology as at the end of 2014, with the majority working within the health industry applying their Clinical Exercise Physiology knowledge and skills. A number have also continued with further postgraduate study.

Clients with cardiovascular or respiratory conditions, or diabetes, are referred to U-Kinetics from MidCentral DHB, Central PHO or GPs for 12-week, fully funded, clinical exercise programmes. Clients undergo exercise testing at the beginning and end of the 12 week

¹ Definition from Exercise & Sport Science Australia (ESSA, www.essa.org.au).

programme, with clients checked and monitored before, during and following each exercise session.

The impact of the role of the Clinical Exercise Physiologist on the health and physical fitness of our clients can be seen in their exercise test results. Significant improvements can be seen across all domains of health (both physical health and mental health) measured in the SF-36v2 Questionnaire (range from 8-14% improvements). Results for Body composition indicate small percentage improvement, with results were largely dependent on the initial health status of the client. Some clients did lose a significant amount of body weight over this 12 week period (up to 20kg). Small % improvements were also seen across measures for waist and hip circumferences along with measures for systolic and diastolic blood pressure. The largest findings were for measures for physical fitness, which showed a 21% and 17% increase in VO_{2max} for males and females respectively, along with a 37% increase the final workload in the exercise test for males and a 32% increase for females. Clients who were referred for a second 12 week period continued to show significant improvements. Client satisfaction for our clinical exercise service was extremely high, with clients reporting health benefits, increased knowledge of exercise and their health conditions, and clients taking some control over their health conditions.

Registration of Clinical Exercise Physiologists in New Zealand is an important next step in continuing to gain recognition for this role within the New Zealand Health System. A new society Clinical Exercise Physiology NZ (CEPNZ) is aiming to launch a registration system in August 2015. As the results of the UCOL Clinical Exercise Physiology programme and the UCOL U-Kinetic *Te Huinga Waioira* Centre show, significant health and wellbeing benefits were achieved with clients with chronic health conditions through the provision of clinical exercise physiology services. U-Kinetics also shows the benefits of strong collaboration between public organisations (both health and education) and between public and private organisations (UCOL and TBI Health) to provide innovative new services with, in this case, multiple outcomes related to improving client health outcomes, improved service provision, and the development of a new workforce. Utilising the expertise of Clinical Exercise Physiology graduates within the health workforce, in collaboration with other medical and health professionals, is an important next step in the development of this workforce.

2. Role of a Clinical Exercise Physiologist in Aged Care

The focus of this project was on demonstrating how the role of a Clinical Exercise Physiologist could work within aged care to focus on the assessment and exercise training of clients with impaired function and complex health conditions. In addition, this project also aimed to explore how a home care worker with a background in exercise science could facilitate a more comprehensive exercise programme within the home setting, under the supervision of a Clinical Exercise Physiologist.

The Clinical Exercise Physiologist for this project was a graduate of the first intake of the Postgraduate Diploma in Clinical Exercise Physiology, and had also been employed as a Clinical Exercise Physiologist within the UCOL U-Kinetics *Te Huinga Wairoa* Centre since graduation. The home workers were recruited from students within the UCOL Bachelor of Exercise & Sport Science degree – two Year 3 degree students were selected, inducted to home support by Lavender Blue and provided with on-job training related to the role of a home support worker. Subjects were recruited through Lavender Blue, with a total of 24 clients selected for the exercise intervention and 15 control subjects who meet the inclusion criteria (average age of subjects was 83.1 and 82.1 for the exercise and control groups respectively). Subjects all received an assessment of balance and physical function at the start of the programme and after an 8 week period, with the exercise intervention receiving an 8 week supervised exercise programme over this period. A total of 4 subject for the exercise group and 2 subjects for the control group were unable to perform the repeat testing due to health issues. The assessment of balance and physical function included questionnaires related to health and wellbeing, fear of falling, activities of daily living and nutritional status, assessment of balance (Berg Balance Scale), and functional testing (grip strength, 5 times Sit-to-Stand Test, Get up and Go Test). Values for body composition, along with resting heart rate and blood pressure, and responses during exercise tasks, were also recorded. The aims of the exercise intervention were to: (1) improve balance and stability; (2) improve functional capacity for activities of daily living; and (3) improve upper body strength and function.

The main results from the study showed subjects in the exercise group had significant improvements in their balance (32.1% improvement in the Berg Balance Scale), their ability to undertake the basic activities of daily living (6.7% improvement), and an improvement in their strength and mobility (12.9% improvement in the 5 times Sit-to-Stand Test, 31% improvement in the Get-Up-and-Go Test and a 9.2% improvement in their overall physical health score as measured by the SF-36v2 questionnaire). The age of the clients, and their complex health conditions, highlighted the importance of the role of the Clinical Exercise Physiologist in this project. The initial assessment was essential for both the development of the exercise programme and the ensuring subject safety during their exercise training. The results show that home support workers with exercise knowledge and skills, under the supervision of a Clinical Exercise Physiologist, can provide in home programmes linked to home support service delivery. Clients reported significant benefits from the programme, highlighting the importance of exercise training in their mobility, balance, ability to perform daily activities of daily living, along with an increase in confidence that comes from being active.

Overall, the exercise programme delivered in this project was over a short period (8 weeks), yet showed significant improvements. Exercise interventions with this population group needs to be focused around an initial intervention to improve physical fitness and followed by a long term maintenance programme. This maintenance programme needs

to be flexible enough to allow for a period of more intense intervention when needed by the client. This project shows that there is potential for home support workers, under the supervision of a Clinical Exercise Physiologist, to support the delivery of in home exercise programmes. Future work needs to determine what training in this area home support workers would need related to exercise science and defining their scope of practice in exercise delivery.

3. Career Pathway Projects & Health

UCOL has been engaged in a number of projects linked to Career Pathways for Clinical Exercise Physiology, along with the development of personal health management skills.

The UCOL Health Academy was established in 2013 under the U-Skills Central Schools Academy at UCOL. The Health Academy includes students from secondary schools coming to UCOL one day per week to complete 40 credits of Level 3 NZQA units across the following subject areas: Anatomy & Physiology, Health and Wellness, Mental Health, Injury Prevention, Exercise, and Nutrition. The aim of the programme is to provide students with the opportunity to experience working within a health related field and to assist them in making an informed decision for further study or employment. This programme initially started in 2013 with 17 students, and is now, at the start of 2015, delivered at UCOL's three campuses (Palmerston North, Whanganui and Masterton) to a total of 43 secondary school students. Students within this programme have achieved a very high level of academic success, with students using this programme as a pathway to further study in health either a UCOL or at other tertiary institutions.

In terms of exposing students to the area of Clinical Exercise Physiology, both Health Academy students and UCOL Health Science students have been placed within U-Kinetics to experience clinical exercise service delivery. All third year UCOL Bachelor of Exercise & Sport Science students now also undertake a placement within U-Kinetics as part of their studies linked to understanding exercise considerations for training clients with medical conditions. We have also placed Year 3 nursing students within U-Kinetics as a trial to increase their awareness of this clinical exercise service and how Nursing can also play a role within this environment. U-Kinetics provides an excellent learning environment for all students who gain the opportunity to undertake a placement at this centre.

UCOL has also trialled a wider programme around UCOL students, outside of the exercise programmes, gaining knowledge and skills related to the management of their personal health and wellbeing. Students who were part of this trial undertook four workshops based around exercise technique, exercise testing, exercise prescription and a vocational exercise (exercise linked to the profession they are studying towards at UCOL), along with receiving access to the UCOL Exercise & Sport Science Gym for their training. A total of 80 students initially took part in this trial. We are currently reviewing how this trial worked and how to implement this on a more permanent basis aligned to the programme they

are studying here at UCOL. In addition, we are also currently implementing a more comprehensive pilot research project around the areas of Nursing and Medical Imaging, focused around self-management of health and wellness, along with injury prevention for their chosen professions.

UCOL U-Kinetics *Te Huinga Waiora*



“Centre for Clinical Exercise Physiology Service Delivery”

U-Kinetics Te Huinga Waiora is a unique and innovative UCOL centre based around providing Clinical Exercise Physiology services. These services include supervised and specific clinical exercise programmes for clients with medical conditions, injuries, or multiple health issues. It is the first specialised Clinical Exercise Physiology centre of its kind in New Zealand which links education and health to improve services and client outcomes. Clients with cardiovascular, respiratory or diabetes conditions are referred directly from specialists at the local hospital or from their doctor for 12 week exercise programmes. All exercise testing and exercise sessions at U-Kinetics are supervised by UCOL Clinical Exercise Physiologists. Postgraduate Diploma in Clinical Exercise Physiology students are directly involved in the daily running of the clinic, working directly with clients across a range of health conditions and working alongside other health professionals.



WHAT IS A CLINICAL EXERCISE PHYSIOLOGIST

A Clinical Exercise Physiologist can be defined as:

“A qualified allied health professional, who specialises in clinical exercise interventions for persons at high-risk of developing, or with existing chronic and complex medical conditions and injuries. These interventions are provided by exercise delivery including health and physical activity education, advice and support and lifestyle modification with a strong focus on achieving behavioural change. Clinical Exercise Physiologists are the most qualified health professional to prescribe exercise for people with chronic disease” (Exercise & Sport Science Australia, 2015)².

A Clinical Exercise Physiologist provides individualised and specialised exercise testing and training, along with lifestyle education, for clients across a wide spectrum of health, from the apparently healthy to those with diagnosed conditions such as cardiovascular disease, diabetes, respiratory disease, or chronic pain or injury. Client safety is achieved through client monitoring and supervision, along with appropriate exercise prescription and adaptations based on exercise testing results and changes in a client’s health and fitness. The clinical exercise physiologist plays an important role in a multi-disciplinary team by providing specialised exercise testing, exercise programming and client education (within their professional scope of practice) in conjunction with other medical and allied health professionals.

A Clinical Exercise Physiologist is recognised in other countries who have recognised this role within the Health Workforce. It is recognised in Australia (Clinical Exercise Physiologist), South Africa (Biokineticist), USA (Clinical Exercise Specialist or Physiologist), and is currently being implemented in Canada (Kinesiologists) and the UK (Clinical Exercise Physiologist).

‘EXERCISE IS MEDICINE’

It is not only in New Zealand that the focus is on increasing the role of physical activity. A good example of how exercise is now included with the medical model of care is a programme called ‘Exercise is Medicine’ in America. This programme was developed by the American College of Sport Medicine (ACSM) in conjunction with American Medical Association (AMA) and has been implemented since 2007. The goal of this programme is to make physical activity and exercise a standard part of a disease prevention and treatment medical paradigm in the United States (Exercise is Medicine, 2011). This is also now being implemented in Australia.

² Definition from Exercise & Sport Science Australia (ESSA, www.essa.org.au).

CLINICAL EXERCISE PHYSIOLOGY LEARNING AT UCOL U-KINETICS

U-Kinetics *Te Huinga Waiora*, is the UCOL facility that provides the clinical placements for the Postgraduate Diploma in Clinical Exercise Physiology programme. Students are required to gain over 540 hours of Clinical Exercise Physiology experience to meet the compulsory clinical requirements of this qualification. Students who enter the Postgraduate qualification undertake an intensive three week induction which covers the following:

- Professional Conduct and Expectations
- Scope of Practice while a Postgraduate Student
- Client Safety and Monitoring Client, including
 - Pre-Exercise Check
 - During Exercise Monitoring
 - Post Exercise Check
- Review of Exercise Testing Protocols, including cycle test, special assessments (including ECG, Spirometry) assessment and functional testing

Following this three week induction, students then begin working with clients within this centre. Students are progressed throughout the programme from observation, to co-delivery, and then to leading the service delivery for that client. Postgraduate students are involved in the delivery of our clinical exercise programmes and individual monitoring of clients – all are under the supervision of qualified and experienced UCOL Clinical Exercise Physiologists and Senior Lecturers on the Postgraduate programme.

The UCOL U-Kinetics Centre is staffed with the following roles:

- Senior Lecturers / Senior Clinical Exercise Physiologists
- Clinical Exercise Physiologists
 - There are graduates of the UCOL Postgraduate Diploma in Clinical Exercise Physiology.
- Graduate Interns – who have recently completed the programme
- Postgraduate Clinical Exercise Physiology Students

GRADUATE INTERNSHIPS

Through the support provided through Health Workforce New Zealand, we have been able to provide graduate internship employment positions for six of our graduates to date. These graduate internships involved paid employment as a Clinical Exercise Physiologist working out of the UCOL U-Kinetics centre, for a 3 month period following completion of their qualification. The provision of these internships following graduation, showcased how beneficial this opportunity can be for the successful graduates, in terms of further developing their clinical skills in the absence of the high academic demands of the programme.

Based on the feedback from our Graduate Interns we are now working to embed graduate internships into the ongoing staffing model of our U-Kinetics facility.

GRADUATE OUTCOMES

Since the Postgraduate Diploma in Clinical Exercise Physiology started in February 2012 through to the end of 2014, a total of 31 students have graduated from the programme, with 97% of students over the period who started successfully completing the programme.

Of these 31 graduates, the following employment outcomes are known:

- 9 are working in Clinical Exercise Physiologist roles, either within U-Kinetics, Aged Care or Maori Health. One of these graduates has worked in Australia and successfully gained ESSA accreditation as an accredited Clinical Exercise Physiologist.
- 7 graduates are working within the DHB's related to either Respiratory or Cardiac Technicians (in Lower Hutt, Wellington, Palmerston North, or Auckland).
- 2 graduates are working in Healthy Lifestyle Advisors/Green Prescription Roles
- 1 graduate is working for ACC as a case manager.
- 5 graduates are working within the fitness industry.
- 1 graduate is engaged in full time Masters study, while 2 others are studying while working as a Clinical Exercise Physiologist.
- 1 Graduate is lecturing within Tertiary Education in the area of Exercise & Sport Science.
- 3 Graduates destinations are currently unknown. 1 of these students is engaged in some further postgraduate study part time.
- 2 Graduates are in employment not related to the area of Clinical Exercise Physiology.

A total of 12 graduates have been employed, and gained additional experience, within our UCOL U-Kinetics centre within the past three years.

Approximately half of graduates have remained within the Palmerston North area, with others in employment throughout the North Island.

Employment outcomes for graduates to date have been very positive. Opportunities are expected to grow for our graduates following the establishment of a registration system for Clinical Exercise Physiologists and recognition of the valuable role they can play within the New Zealand health system.

CEP801 Clinical Exercise Physiology

Level 8, 30 Credits

The aim of this programme is to provide students with a solid understanding of the scope of practice of the clinical exercise physiologist, and the role of lifestyle, psychosocial and cultural factors in the development and management of medical conditions and musculoskeletal injuries. Students will also develop advanced clinical knowledge of exercise testing and exercise prescription for medical conditions and musculoskeletal injuries.

CEP802 Clinical Exercise Physiology Practicum

Level 8, 60 Credits

The aim of this course is to provide students with clinical exercise physiology experience working with real clients across a range of medical and musculoskeletal conditions. In addition, this course aims to enable students to critically evaluate their experiences so as to improve professional practice and client outcomes.

Students must complete a minimum of 540 hours of clinical exercise physiology experience in the following areas:

- a minimum of 180 hours in the area of cardiovascular conditions or metabolic conditions
- a minimum of 120 hours in the area of respiratory conditions, neurological conditions, or cancer
- a minimum of 180 hours in the area of orthopedic diseases or musculoskeletal injuries or conditions
- a minimum of 60 hours related either to (1) additional work with clients with any clinical condition, or (2) other clinical exercise activities, including health checks, health promotion/education, workplace wellness/health programmes, diagnostic investigations

CEP803 Advanced Exercise Physiology I

Level 8, 15 Credits

The aim of this course is to provide students with advanced knowledge and understanding of clinical exercise physiology related to cardiovascular, respiratory and metabolic conditions, and cancer. In addition, students will develop advanced practical skills related to exercise assessment and prescription for these conditions in clients with complex health conditions, and monitoring of client safety and progression.

CEP804 Advanced Exercise Physiology II

Level 8, 15 Credits

The aim of this course is to provide students with advanced knowledge and practical skills related to exercise assessment and prescription for conditions of the musculoskeletal and neurological systems, and an understanding of chronic pain and fatigue mechanisms. A further aim is to enable students to develop and implement vocationally-specific exercise and rehabilitation programmes.

Clinical Exercise Physiology – Graduate Profile:

Graduates of the Postgraduate Diploma in Clinical Exercise Physiology will be able to demonstrate the following skills, knowledge, understanding and attributes:

- A critical understanding of the role of clinical exercise physiologists, including professional boundaries and relationship to other health professionals
- Advanced knowledge of the pathophysiology of injuries and medical/health conditions and related medications
- Advanced knowledge of the role of lifestyle education (including nutrition) and psycho-social factors in the development and management of medical/health conditions and injuries
- The ability to accurately assess and monitor client risk prior to engaging in, and during, exercise testing and an exercise programme, including appropriate referral to medical professionals
- Competency in specialised exercise or functional testing and specialised exercise prescription for a range of medical conditions and injuries, while ensuring client safety
- The ability to implement appropriate strategies to improve client outcomes across a range of complex health conditions
- The ability to work with a variety of health professionals as part of a multi-disciplinary team across a range of medical/health conditions and musculoskeletal injuries
- Well-developed interpersonal skills and heightened cultural competency, enabling effective professional interactions with clients, colleagues and the wider community
- The ability to work with clients from a range of cultures, developed through an understanding of models of health and cultural practices, with the ability to apply this understanding to clinical practice
- Applied understanding of the research process and the ability to utilise research findings to improve clinical practice

CLINICAL EXERCISE PHYSIOLOGY – CLINICAL EXPERIENCE

Within the Postgraduate Diploma in Clinical Exercise Physiology, students must complete a minimum of 540 hours of clinical exercise physiology experience in the following areas:

- Minimum of 180 hours in the area of cardiovascular conditions or metabolic conditions
- Minimum of 120 hours in the area of respiratory conditions, neurological conditions, or cancer
- Minimum of 180 hours in the area of orthopedic diseases or musculoskeletal injuries or conditions
- Minimum of 60 hours related either to (1) additional work with clients with any clinical condition, or (2) other clinical exercise activities, including health checks, health promotion/education, workplace wellness/health programmes, diagnostic investigations.



“Centre for Clinical Exercise Physiology Service Delivery”

The following results showcase the significant client outcomes that are resulting from the specialised delivery of Clinical Exercise Physiology Exercise Programmes based out of the UCOL U-Kinetics *Te Huinga Waiora* Centre. These results demonstrate the excellent work that the UCOL Clinical Exercise Physiologists and Postgraduate Diploma in Clinical Exercise Physiology students are doing with clients referred for our services. These results clearly demonstrate the benefits to clients with diabetes, respiratory disease or cardiovascular disease can gain from the specialist exercise services that a Clinical Exercise Physiologist can provide.

U-KINETICS *TE HUINGA WAIORA* – REFERRALS

U-Kinetics has been operating now from May 2012 and has supported three intakes of students for the Postgraduate Diploma in Clinical Exercise Physiology. The next intake is scheduled for February 2015.

During this time we have received over 1100 referrals, which includes clients from MidCentral DHB (clients with Cardiac, Diabetes or Respiratory conditions) or for clients with these or other conditions as private clients. In addition to this, we have worked collaboratively with TBI Health in supporting their client exercise rehabilitation services. Referrals to U-Kinetics can be received either via MidCentral DHB, Central PHO or GP referral.

The demand for the U-Kinetics programmes is extremely high and we now have a waiting list for client to start their programme. We are currently working with MidCentral DHB and other health providers regarding how to manage this waiting time.

As shown in Figure 1, the majority of clients referred are between the ages of 40-80 years of age. The average of referred client for Cardiac Clients is 63.3 years, for Diabetes Clients is 55.4 years and for Respiratory Clients is 54.0 years. The age range of clients undertaking exercise programmes at U-Kinetics is 15.6 years through to 86.2 years. Figure 2 shows the age of referrals (expressed as a % of total referrals) for both NZ European and Maori clients.

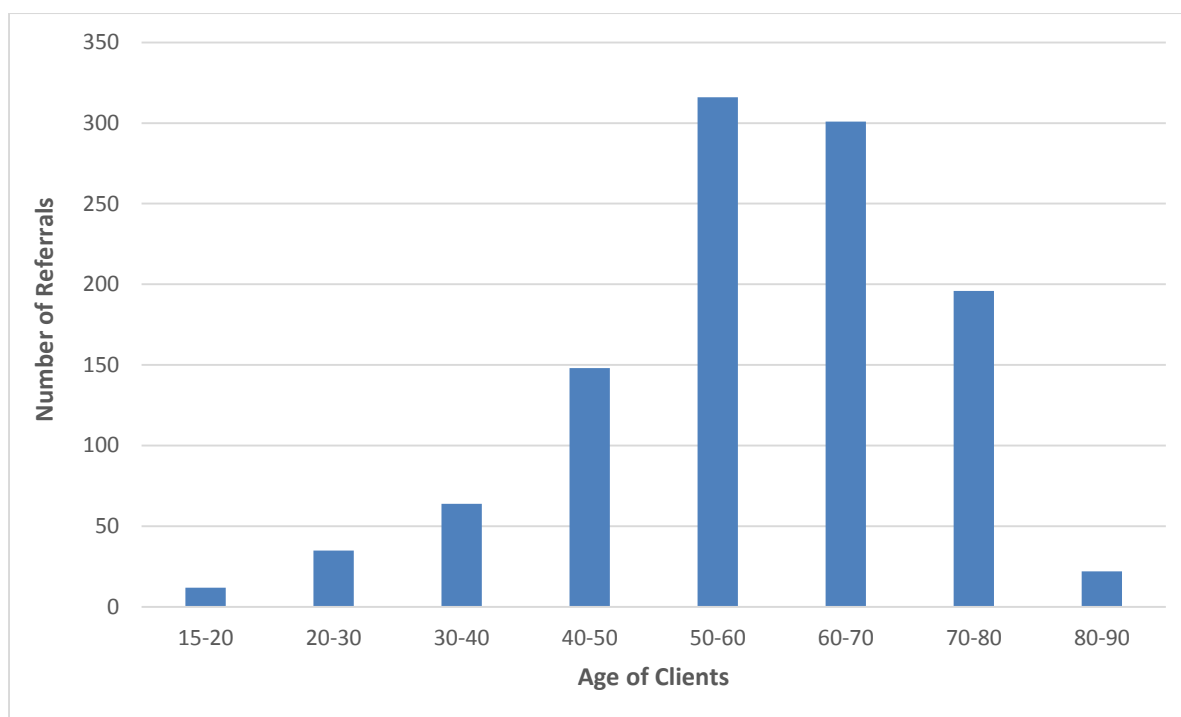


Figure 1. Referrals to U-Kinetics *Te Huinga Waiora* – 1st May 2012 through until 31st December 2014, by age group.

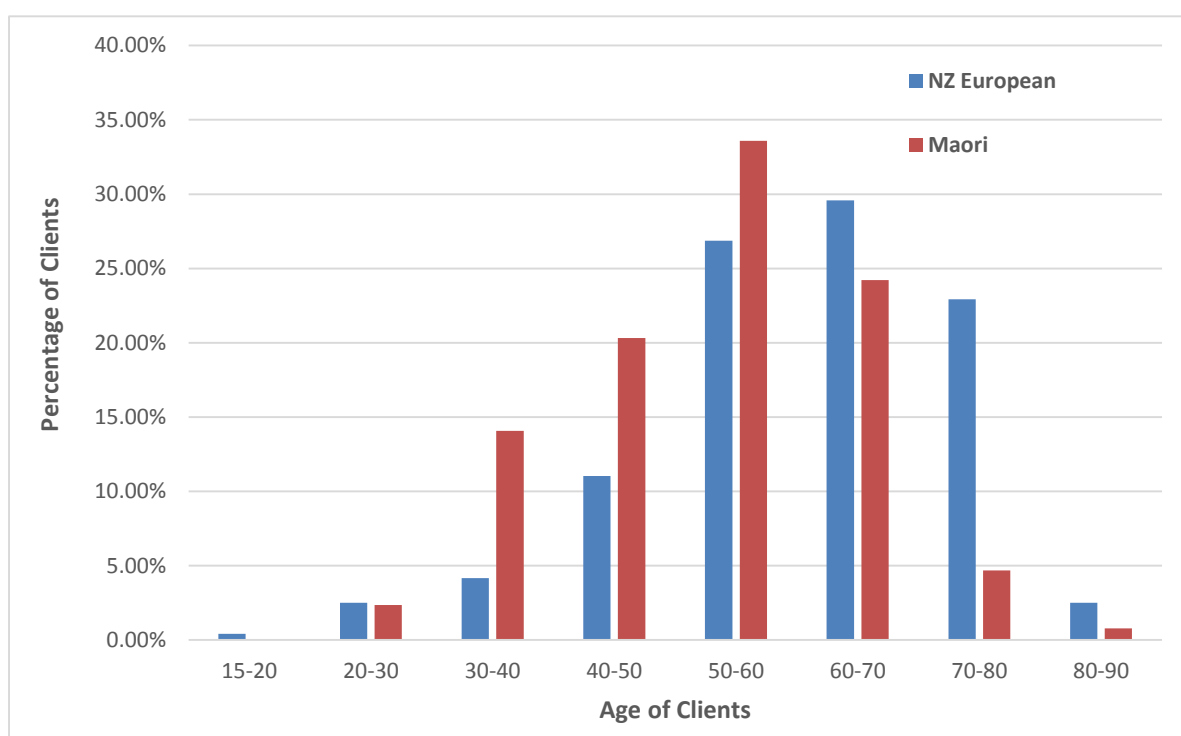


Figure 2. Referrals to U-Kinetics *Te Huinga Waiora* – 1st May 2012 through until 31st December 2014, by ethnicity and age group (and expressed as a percentage of total referrals for each ethnicity).

U-KINETICS TE HUINGA WAIORA – SUMMARY OF CLIENT RESULTS

Client testing involves clients completing an initial interview (which also involves completion of health and wellbeing questionnaires), followed by exercise testing to determine fitness and exercise capacity. The client's results from this process form the basis for setting appropriate, and individualised, exercise programmes and intensities for each client.

Results, as of the 31st of December, show significant improvements across all tests used to track client outcomes. Of the referrals received at U-Kinetics at this date, approximately 520 clients have undergone their initial assessment, with the results in this report focusing on approximately those clients who have completed their 12 week exercise programmes – this relates to approximately 350 clients who have fully completed their 12 week exercise programmes, and an additional 150 clients who have also completed a second referral for a second 12 week period.

A summary of the key results are shown in the following key sections:

- A. SF-36v2 Questionnaire
- B. Body Composition Changes
- C. Physical Fitness Changes

A. SF-36v2 Questionnaire

The SF-36v2 is a self-reported questionnaire that provides measurements across both mental and physical health – across 8 main domains of health:

- Physical Functioning
- Role – Physical
- Bodily Pain
- General Health
- Vitality
- Social Functioning
- Role – Emotional
- Mental Health

While also giving two overall scores for:

- Overall Physical Health Score
- Overall Mental Health Score

SF-36v2 Questionnaires were analysed as per the process outlined in the following reference:

Reference: Ware, J.E. (2007). *User's Manual for the SF-36v2 Health Survey (2nd Ed)*.

A recent publication³ identified the following population norms for New Zealanders, based on a total of over 12,000 completed SF-36v2 questionnaires:

Table 1. New Zealand Norms for the SF-36v2 subscales¹.

SF-36 Subscales	Mean	Range	STDEV
Physical Functioning	85.9	0-100	21.8
Role – Physical	85.7	0-100	23.2
Bodily Pain	75.3	0-100	24.2
General Health	74.5	0-100	19.7
Vitality	64.0	0-100	18.4
Social Functioning	88.4	0-100	20.5
Role – Emotional	93.7	0-100	15.0
Mental Health	82.3	0-100	13.2

Table 2 below outlines the results to date for this questionnaire (expressed as mean values and average percentage improvement) between the baseline assessment and at completion of their 12 week assessment.

As shown in Table 2, all domains of the SF-36v2 show significant improvements over the 12 week period of the programme (average of a 7-14% improvement). This shows the U-Kinetics exercise programme resulted in improvements across all aspects measured related to both physical and mental health and wellbeing of the client. Comparing our results to the population norms for New Zealand, we see that the population group referred to U-Kinetics (a population that suffers from chronic medical conditions) have significantly lower values for all sub-scales of the SF-36v2 questionnaire.

Table 3, below, outlines the results for the SF-36v2 Questionnaire for those clients who completed a second 12 week referral to U-Kinetics. This second referral meant that the client had completed a 24 week programme, with assessments taking place at baseline, 12 weeks and 24 weeks. This table also highlights the percentage change from baseline at both 12 weeks and 24 weeks – and also shows for these gains, what percentage of the gains were achieved within the first 12 weeks. With the exception of the social functioning domain, all categories continued to improve over the second 12 week period. The results from this questionnaire indicate that the second referral was certainly of benefit to the client.

³ Reference: Frieling, M.A., Davis, W.R. & Chaing, G. The SF-36v2 and SF-12v2 health surveys in New Zealand: norms, scoring coefficients and cross-country comparisons. *Australian and New Zealand Journal of Public Health*. 37(1): 24-31.

Table 2. SF-36v2 Questionnaire Results expressed as an Average Percentage Improvement between the results at Baseline and completion of their 12 week programme (n=336).

Category	Baseline Assessment		Final Assessment
	Mean (\pm STDEV)	Range	Average % Change after 12 weeks
Physical Functioning	39.31 (\pm 10.50)	14.94-57.03	12%
Role – Physical	39.95 (\pm 10.94)	17.67-56.85	14%
Bodily Pain	44.28 (\pm 10.84)	19.86-67.19	8%
General Health	41.00 (\pm 10.50)	12.42-63.90	11%
Vitality	45.74 (\pm 9.82)	17.75-67.70	11%
Social Functioning	44.62 (\pm 10.97)	13.22-56.85	11%
Role – Emotional	42.773 (\pm 13.21)	9.23-55.88	13%
Mental Health	49.49 (\pm 9.70)	16.22-64.09	7%
Overall Physical Health Score	39.62 (\pm 9.78)	9.24-59.69	11%
Overall Mental Health Score	48.43 (\pm 10.76)	7.57-67.89	9%

Table 3. SF-36v2 Questionnaire Results expressed as an Average Percentage Improvement between the results at Baseline and completion of 12 and 24 weeks (n =146, 83 Males & 63 Females).

Category	Baseline Assessment	% Change		
	Mean (\pm STDEV)	Baseline to 12 Weeks	Baseline to 24 Weeks	% of Total Change Achieved in First 12 Weeks
Physical Functioning	36.66 (\pm 10.37)	17.2%	23.3%	74%
Role – Physical	44.83 (\pm 10.54)	19.1%	23.8%	80%
Bodily Pain	44.44 (\pm 11.08)	8.1%	10.0%	81%
General Health	39.70 (\pm 10.96)	14.3%	19.4%	74%
Vitality	45.01 (\pm 9.90)	13.5%	15.6%	87%
Social Functioning	42.92 (\pm 11.44)	14.4%	14.0%	103%
Role – Emotional	40.89 (\pm 13.24)	16.8%	18.0%	93%
Mental Health	48.60 (\pm 9.83)	7.1%	8.5%	83%
Overall Physical Health Score	37.63 (\pm 9.85)	15.5%	21.1%	73%
Overall Mental Health Score	47.60 (\pm 10.83)	10.4%	10.2%	102%

B. Body Composition

Results for body composition changes following the 12 week U-Kinetics programme are shown below in Table 4. Mean results for body composition show improvements across all measures, however mean changes across some of the measures are limited, with the exception of percentage body fat, over this period.

This result reflects the high variability in body composition changes between clients (with some client significantly increasing their body weight, which for some clients was needed to improve their health, while others are losing significant amounts of body weight – the range was from an approximate 7kg increase to a 20kg decrease in body weight). The change in percentage body fat certainly highlights the composition changes that are happening over this period which are not reflected in body weight changes (i.e. with a decrease in fat mass and an increase in muscle mass resulting from training). Two other key factors that determine the changes that occur to body composition during this time include (1) the exercise tolerance of the client at the start of their programme (it is often a slow process to increase exercise capacity to promote significant weight loss) and (2) whether the client applies basic dietary advice given in conjunction with their training programme.

As shown in Table 5 below, the changes in body composition from clients who completed 24 weeks (i.e. had a second referral) continued to show significant improvements over the second 12 week period. As for the results for the SF-36v2 Questionnaire, all parameters for body composition continued to show improvements over the second 12 week period. These results certainly highlight the significant benefit for these clients in receiving a second 12 week referral to U-Kinetics.

Table 4. Body Composition Results, expressed as an Average Percentage Improvement, between the results at Baseline and completion of their 12 week programme (n = 349; Males = 199, Females = 150).

Category	Baseline Assessment		Final Assessment
	Mean (\pm STDEV)	Range	Average % Change after 12 weeks
Body Weight			
- Male	99.30 (\pm 27.25)	42.2-235.8	-2.0%
- Female	90.68 (\pm 25.23)	41.6-181.0	-0.7%
Body Mass Index			
- Male	32.6 (\pm 8.1)	16.9-67.3	-1.8%
- Female	34.9 (\pm 9.0)	18.6-63.7	-0.6%
Waist Circumference			
- Male	110.7 (\pm 19.3)	60.4-180.6	-2.2%
- Female	105.9 (\pm 21.3)	65.5-162.5	-1.9%
Hip Circumference			
- Male	111.5 (\pm 15.9)	75.1-187.7	-1.8%
- Female	119.6 (\pm 17.6)	82.5-166.0	-0.9%
% Body Fat			
- Male	22.9 (\pm 13.5)	5.5-73.4	-8.1%
- Female	36.6 (11.3)	12.0-63.4	-4.3%

Table 5. Body Composition Results, expressed as an Average Percentage Change, between the results at Baseline and completion of 12 and 24 weeks (n =146, 83 Males & 63 Females).

Category	Baseline Assessment	% Change		
	Mean (\pm STDEV)	Baseline to 12 Weeks	Baseline to 24 Weeks	Average % of Total Change Achieved in First 12 Weeks
Body Weight				
- Male	103.1 (\pm 30.3)	-3.3%	-4.2%	77.8%
- Female	95.8 (\pm 29.0)	-1.6%	-2.1%	
Body Mass Index				
- Male	33.8 (\pm 8.7)	-3.0%	-3.8%	72.6%
- Female	36.8 (\pm 10.4)	-1.6%	-2.5%	
Waist Circumference				
- Male	114.2 (\pm 23.6)	-3.0%	-3.8%	80.1%
- Female	110.3 (\pm 23.6)	-3.1%	-3.7%	
Hip Circumference				
- Male	114.7 (\pm 17.3)	-2.8%	-3.6%	68.9%
- Female	123.8 (\pm 19.6)	-1.3%	-2.4%	
% Body Fat				
- Male	24.4 (\pm 15.0)	-9.2%	-11.4%	74.2%
- Female	37.6 (\pm 12.0)	-6.6%	-10.0%	

C. Physical Fitness

Results for Physical Fitness, as shown in Table 6, show the most significant changes as a result of the U-Kinetics 12 week programme. The results for the measures of physical fitness (VO2max / METs, and Exercise Workload) show highly significant results (VO2max / METs show a 17-21% increase and Exercise Workload a 32-37% increase over the 12 weeks). Results for resting blood pressure also show significant reductions as a result of the 12 week period (between a 2.4-3.7% reduction) with resting heart rate only showing a small improvement which may be the result of this being a highly variable measure.

The results for those clients who have completed two referrals (24 weeks), as shown in Table 7, again highlights that significant gains continue for the clients physical fitness over the second 12 week period. As shown in this table, on average approximately two-thirds of the gains observed at 24 weeks were achieved in the first 12 week period, with the gains in the second 12 weeks also being significant and would demonstrate a large increase in the clients functional abilities.

Table 7 also demonstrates variability regarding the observed changes to physical fitness between males and females. For example, for exercise workload, results for male clients indicate a 59.2% increase in Exercise Workload Attained during the exercise testing, results for females resulting in 50.6% increase. This trend was also reflected in changes for physical fitness (VO2max / METs) while females showed a much greater decrease in systolic blood pressure after 24 weeks compared with males. Again, as per results for the SF-36v2 Questionnaire and body composition, clients again demonstrated significant improvements during the second 12 week referral, indicating that this was certainly beneficial for the client.

When examining the results for the three major referred conditions to U-Kinetics, as shown in Table 8, we see that regardless of the medical condition of the client, significant improvements across the three assessment categories were achieved after the first 12 week referral. Each medical condition has factors that impact both on exercise prescription and a client's exercise capacity or tolerance (e.g. stability of blood glucose levels in diabetics, level of dyspnoea in respiratory clients) – which will impact on the rate of improvements for the client. These results all show the current programme is proving very effective for clients in overcoming some of these exercise limitations based on their medical conditions (and co-morbidities) with all obtaining significant improvements in health and physical fitness.

Table 6. Physical Fitness & Strength Results for Clients who have completed a 12 Week Programme (n = 349; Males = 199, Females = 150)

Category	Baseline Assessment		Average % Change
	Mean (\pm STDEV)	Range	
Physical Fitness (VO ₂ max – ml/kg/min)			
- Males	20.51 (\pm 6.4)	10.3-43.3	21%
- Females	17.57 (\pm 4.9)	9.5-33.0	17%
Physical Fitness (VO ₂ max –METs)			
- Males	5.86 (\pm 1.8)	3.0-12.4	21%
- Females	5.02 (\pm 1.4)	2.7-9.4	17%
Resting Heart Rate			
- Males	70.5 (\pm 12.9)	42-102	-2.2%
- Females	74.0 (\pm 12.9)	43-110	-2.9%
Resting Systolic Blood Pressure			
- Males	135.7 (\pm 14.8)	90-180	-2.7%
- Females	136.4 (\pm 18.3)	100-186	-3.5%
Resting Diastolic Blood Pressure			
- Males	81.4 (\pm 10.6)	42-110	-3.7%
- Females	80.0 (\pm 9.9)	60-108	-2.4%
Exercise Workload Attained (Watts)			
- Male	66.2 (\pm 26.3)	20.0-150.0	37%
- Female	48.0 (\pm 18.1)	20.0-110.0	32%

Table 7: Physical Fitness & Strength Results for Clients who have completed a 24 Week Programme (n =146, 83 Males & 63 Females)

Category	Baseline Assessment	% Change		
	Mean (\pm STDEV)	Baseline to 12 Weeks	Baseline to 24 Weeks	Average % of Total Change Achieved in First 12 Weeks
Physical Fitness (VO ₂ max – ml/kg/min)				
- Males	19.2 (\pm 6.0)	22.0%	35.2%	66.1%
- Females	16.7 (\pm 4.4)	18.1%	24.5%	
Physical Fitness (VO ₂ max –METs)				
- Males	5.5 (\pm 1.7)	22.0%	35.2%	66.1%
- Females	4.8 (\pm 1.3)	18.1%	24.5%	
Resting Heart Rate				
- Males	72.9 (\pm 12.4)	-4.4%	-6.6%	85.2%
- Females	74.9 (\pm 11.9)	-2.9%	-1.3%	
Resting Systolic Blood Pressure				
- Males	134.9 (\pm 14.9)	-1.6%	-1.9%	84.7%
- Females	136.2 (\pm 17.8)	-3.8%	-4.4%	
Resting Diastolic Blood Pressure				
- Males	81.1 (\pm 10.5)	-4.1%	-3.2%	115.0%
- Females	81.0 (\pm 10.4)	-2.6%	-2.7%	
Exercise Workload Attained (Watts)				
- Male	60.9 (\pm 24.0)	38.0%	59.2%	66.5%
- Female	45.2 (\pm 18.6)	36.1%	50.6%	

Table 8. Summary of mean SF-36v2, Body Composition and Physical Fitness Results, expressed per client main medical condition between Baseline and completion of their 12 week programme (n=349).

	Cardiac (n=134)			Respiratory (n=122)			Diabetes (n=93)		
	Baseline	12 Week	% Change	Baseline	12 Week	% Change	Baseline	12 Week	% Change
<u>SF-36v2 Questionnaire:</u>									
Physical Functioning	41.4	46.3	11.8%	36.2	41.6	14.9%	40.3	44.6	10.7%
Role-Physical	40.8	45.9	12.5%	37.7	44.9	19.0%	41.5	45.5	9.6%
Bodily Pain	46.5	50.2	7.9%	45.7	49.2	7.8%	43.0	45.9	6.8%
General Health	45.9	48.9	6.6%	37.1	42.7	15.1%	38.9	44.0	12.9%
Vitality	47.5	53.2	12.1%	44.7	49.8	11.5%	44.6	49.3	10.5%
Social Functioning	46.0	51.3	11.4%	43.6	48.5	11.1%	43.9	48.4	10.2%
Role-Emotional	44.0	49.2	11.9%	40.9	48.1	17.8%	43.4	47.3	8.9%
Mental Health	49.8	53.5	7.3%	49.7	52.7	6.0%	48.6	52.9	8.7%
Physical Component score	42.2	46.3	9.7%	36.9	42.3	14.6%	39.4	43.2	9.8%
Mental component score	49.2	53.8	9.5%	48.2	52.8	9.6%	47.7	51.9	8.8%
<u>Body Composition:</u>									
Weight	88.6	87.1	-1.7%	95.6	94.3	-1.3%	105.8	104.4	-1.3%
BMI	30.5	30.1	-1.4%	33.9	33.5	-1.2%	37.6	37.1	-1.2%
Waist Circumference:	102.6	100.4	-2.2%	108.8	106.3	-2.3%	117.2	115.4	-1.5%
Hip Circumference	109.7	107.8	-1.7%	115.6	114.1	-1.3%	121.9	120.6	-1.1%
Waist:Hip Ratio	0.93	0.90	-0.5%	0.94	0.93	-0.9%	0.96	0.96	-0.4%
% Body Fat	22.9	21.2	-7.2%	29.6	27.3	-7.7%	36.3	35.1	-3.4%
<u>Physical Fitness:</u>									
Resting Heart Rate	66.3	65.0	-2.0%	75.3	72.6	-3.7%	75.9	74.6	-1.7%
Systolic BP	132.6	129.3	-2.6%	135.5	131.1	-3.2%	141.6	136.6	-3.5%
Diastolic BP	79.1	76.6	-3.2%	81.2	79.2	-2.5%	82.6	79.3	-4.0%
Exercise Workload Attained (Watts)	61.7	86.5	40.1%	54.3	71.1	31.0%	59.0	78.1	32.3%
Physical Fitness (VO _{2max})	19.3	23.5	21.5%	19.8	23.4	18.4%	18.5	21.5	16.1%
Physical Fitness (METS)	5.5	6.7	21.5%	5.6	6.7	18.4%	5.3	6.1	16.1%

D. Higher Risk U-Kinetics Clients:

As part of the analysis we examined clients who had a very low functional capacity (< 5 METs) at their initial assessment. The importance of 5 METs (equivalent to a VO₂max of 17.5 ml/kg/min) is significant, as various studies show that clients with a functional capacity of lower than 5 METs have the highest all-cause mortality, while very few deaths (in some case no deaths) occurred in groups with a functional capacity higher than 9.2 METs (equivalent to a VO₂max of 32.2 ml/kg/min).

In the group of clients with a functional capacity lower than 5 METs a total of 136 clients completed 12-weeks. In this group the following gains were achieved:

- Number of clients with a functional capacity lower than 5 METs decreased from 44.3% to 22.1%.
- Overall functional capacity of the group increased by 25.3%
- Maximum wattage that these clients could manage during Stage 3 of the cycle ergometer test increased by 43.8%
- Their SF-36v2 overall physical health score improved by 12% and overall mental health score improved by 10.6%
- Depression scores decreased by 29.5%

After 12-weeks a total number of 24 clients still had a functional capacity lower than 4.3 METs. These were the very fragile respondents with essentially end-stage disease. The following gains were achieved in this group:

- Resting SBP decreased by 3.7%
- Resting DBP decreased by 5.4%
- Maximum wattage they could manage during the last stage on the cycle ergometer test increased by 23.2%
- Systolic blood pressure response during exercise improved by 17.7%
- Angina scores during the last stage of the cycle ergometer test decreased by 16.1% (this was achieved at 23.2% higher wattage)
- Their SF-36v2 overall physical health score improved by 18.7% and overall mental health score by 7.7%
- HADS anxiety scores decreased by 34.8%
- HADS depression scores decreased by 20.7%

In the group of clients who had completed their second referral (i.e. completed a total of 24-weeks at U-Kinetics, n=133), 67 clients (47.1%) started lower than 5 METs and only 10.3% was still lower than 5 METs afterwards. The following gains were achieved by this group:

- Resting SBP decreased by 5.1%

- Resting DBP decreased by 8.9%
- Maximum wattage during last stage on the cycle ergometer test increased by 57.3%
- Systolic BP response during the cycle ergometer test improved by 6.1%
- Overall physical functioning score on the SF-36v2 improved by 28.5%
- HADS anxiety score decreased by 8.6%
- HADS depression score decreased by 26.6%

These results show that those with impaired function have a lot to gain from the U-Kinetics programme, and it also shows the importance of the second referral as this group as they continued to show significant improvements over this period.

Summary

Overall, the results presented in this report clearly outline the significant benefit that clients are getting from the clinical exercise physiology programme. The 12 week exercise programme is resulting in significant improvement across the measures of the SF-36v2 Questionnaire, Body Composition and Physical Fitness. U-Kinetics provides a safe and supportive exercise environment for its clients, where they receive individualised clinical exercise programmes and are closely monitored before, during, and after each exercise programme by our Clinical Exercise Physiologists and Postgraduate Clinical Exercise Physiology students. Additionally, clients that are referred for a second 12 week period continue to significantly improve across all three of these areas. The results clearly show the physiological and psychological benefits that our clients have been receiving. We are currently in discussions with Mid-Central DHB regarding gaining access to our client's health data to be used for determining the cost effectiveness or benefits from our Clinical Exercise Physiology services.

The success of the U-Kinetics programme is in the significant client outcomes that have been achieved, alongside the development a new workforce of Clinical Exercise Physiologists, who can go on to make a significant contribution in the health and wellbeing of the New Zealand population. This initiative has also seen the establishment of a unique facility that combines both health and education sectors through private and public partnerships. The key is ensuring that this workforce is recognised and the health workforce utilises their expertise working alongside existing health and allied health professionals focused on improvement outcomes for clients.

SUMMARY OF STAKEHOLDER FEEDBACK

A. CLIENT FEEDBACK

The feedback from our clients at U-Kinetics *Te Huinga Waiora* is extremely positive, with many reflecting a very positive and supportive environment, the expertise of our Clinical Exercise Physiologists and our Postgraduate students, and the benefits they have gained through our clinical exercise programmes.

A summary of the information gained from our client satisfaction surveys can be seen below.

A total of 308 clients have completed our Client Satisfaction Survey upon completion of their exercise programmes at U-Kinetics.

Question	Average Rating (out of 5)
The exercise programme has helped me manage my heart/lung/metabolic condition more effectively	4.65
There has been a meaningful improvement in my health as a result of the exercise programme	4.65
All information received was pitched at an appropriate level of understanding	4.78
The exercise programme met my expectations	4.72
I found the exercise programme to be worthwhile and helpful	4.83
The staff / students at the clinic were knowledgeable and helpful	4.87
The facility and equipment met my expectations	4.86
I would recommend this exercise programme to others with a heart/lung/metabolic condition	4.94

As these ratings show, client satisfaction at U-Kinetics is extremely high – we are constantly receiving excellent feedback regarding our services, the staff and students, and the improvement clients are getting.

An overview summary of client feedback can be found below:

- *The monitor of my blood pressure, heart rate and blood glucose from start to finish daily gave me an clear understanding of how to train and also the effect that exercise have on blood glucose.*
- *The program has enhanced my confidence in my health and knowledge to be in control of the condition (Type 2 Diabetic) I have.*

- *The program had a definitely positive influence on me to give me a better idea of consistent taking of medication and the positive outcomes it produces*
- *U-Kinetics is a well-resourced, friendly facility with well trained, encouraging and positive staff. I loved it. Thank you so much – the staff/student are amazing. Love your personal approach – kind yet firm.*
- *This programme would encourage anyone with a long term, limiting condition to do more exercise. The supervision is excellent and most helpful. The end results also show how beneficial it is to improve physical well-being.*
- *I have a greater appreciation of exercise and the benefits it have on my health condition.*
- *The programme gave me back what I had a long time ago.*
- *The program showed me that change starts within one's self, once you've decided to change and get the right advice and support.*
- *The program had a major influent on me and my lifestyle.*
- *I loved the way the staff were so friendly and encouraging. The just made the workout easier somehow. I really appreciate you all very much*
- *During the programme my knee problems were picked up and the change the exercise programme to meet my needs. It's the best thing ever happening to me. Best staff and students. Encouragement. They make people reach out and take me to my limits.*
- *I am very enthusiastic about this programme. Can't stop telling people about the program... It has removed my fear of exercise.*
- *As a quadruple heart bypass patient, this programme took me from being unfit to being fitter than ever. Great programme. Great staff.*
- *My time at the U-Kinetics clinic was life-changing for me. I highly recommend this clinic for anybody who wants to do something for their health condition. I have definitely done something for myself!!*
- *I know after my heart attack I needed to do some physical exercise. The U-Kinetics program provided me a professionally designed custom work out that was closely monitored. It had a significant positive impact on my health and well-being.*
- *The programme has been the catalyst for my change of lifestyle. Regular exercise and improved eating habits have been responsible for my weight loss and improved health. The client specific programme and constant support and encouragement have meant susses. Wonder full programme to get your life back.*
- *Grab this opportunity with both hands and your heart and your head. You've just been given the best life line you could get, so maximise its benefits.*
- *Following heart surgery the program has enable me to be confident of the way forward.*
- *Coming here has given me self-confidence and I feel more in control of my health.*
- *I can breathe mush easier and has guarded against chests infections. I'm more positive. Top of the range facilities. Great atmosphere.*
- *My blood sugar levels mean I have less insulin during the day.*
- *Blood in lower legs now appears to be returning better and the ulcers I have had for 2 years have all but healed and disappeared while I have been on the programme.*
- *I finally feel like I can get on top of my health worries, rather than feeling like it is the sentence I carry around with me.*
- *The programme is the catalyst for a lifetime of regular exercise. I am already buoyed by the fact that not only can I now see my toes, but I can actually touch them.*

B. MID-CENTRAL HEALTH AWARD

UCOL and U-Kinetics were successful in attaining the MidCentral DHB People's Choice Health Award in 2013 – the press release from MidCentral DHB is below:

U-Kinetics Takes Home People's Choice Award MidCentral DHB Health Awards 2013

<http://www.midcentraldhb.govt.nz/News>

19/10/2013

UCOL clinical exercise physiology rehabilitation service U-Kinetics takes home the People's Choice Award at this Year's MidCentral District Health Board Health Awards.

Beating out 31 other finalists at Friday's (18th) ceremony, popular vote awarded the service the accolade for their new and innovative approach to providing specialised exercise service to clients with medical conditions.

Run in collaboration between UCOL, MidCentral DHB and TBI Health, the service runs exercise programmes for cardiac clients, respiratory clients and diabetics (referred from MDHB) and clients with musculo-skeletal injuries.

The service has proved extremely popular, with uptake of the programme continuing to exceed all expectations. Clients are seeing huge health gains including: improved quality of life, reduction of risk factors for cardiovascular disease, and a vast improvement in mood and motivation. Many patients have requested re-referral.

The programme shows injury does not mean the end of an active lifestyle. Clients come in for a 12-24 week exercise programme, fully funded by MDHB with the aim of getting back out doing what they love as soon as possible.

In one case, a 22-year-old patient came into the clinic suffering from severe asthma. Unable to distinguish the difference between being short of breath due to exercise and asthma, the client had very little exercise IQ as she had always been scared of triggering an asthmatic episode. By the end of her 12-week programme, the client had learned to distinguish between the two; increasing her confidence and making huge improvements to all aspects of physical and psychological measured parameters. The patient now aims to walk a half marathon later this year.

The judges commented that this is a service that has been very well received by its clients: "This is a new programme demonstrating exciting potential to achieve improved outcomes from participants."

UCOL was also a finalist for the 2014 MidCentral DHB Health Awards in the following categories:

- Supreme Award – Excellence in Integrated Health Care Award
- Excellence in Optimising the Health Status of Priority Populations Award
- Excellence in Research and Innovation in Health Care Award

EXAMPLES OF CLIENT STORIES IN THE NEWS

“A Breathtaking Achievement”, Manawatu Standard, 21/11/2014

Excerpt from Article:

“A few years ago Sarah Findlay could barely walk a kilometre without becoming breathless. Now the Palmerston North 23-year-old, who has chronic severe asthma, is gearing up to walk a half-marathon. Findlay has had the disease since she was 3 years old and has spent a huge part of her life in and out of hospitals. “Two-and-a-half years ago I could barely walk 1 kilometre without getting breathless, I could barely clean my bedroom without getting breathless, I couldn't jump on the trampoline at work, I couldn't do much without getting breathless,” she said. “It's been pretty hard because I haven't been able to do what normal teenagers could do.” Two years ago she was referred to specialist exercise rehabilitation centre U-kinetics where she built up her endurance.” ...

“Shedding 100kg - But More to Go”, Dominion Post & Kapiti Mana News, 30/9/2014

Excerpt from Article:

Last year Petranoff Smith ate 16 slices of bread, 16 eggs, a packet of bacon and a heavy smattering of cheese for breakfast. Now, 100 kilograms lighter, he eats three Weet-Bix and is planning a five-kilometre walk. Everywhere Smith goes he carries a folder of photos, as a reminder of how far he has come and the people who have helped. “I was so embarrassed,” he said. “I stayed in my car mainly because I was too embarrassed to show my face in public. “Today I walk standing tall.” ... Smith credits his success to a UCOL programme, U-Kinetics, and to cutting out junk food.” ...

Follow Up Stories:

- Supervision Key to Weight Loss – Stuff.co.nz
- Brother's Love Inspiration for 100kg Weight Loss – Campbell Live

“Clinic churning out better health”, Manawatu Standard, 21/09/2013

Excerpt from Article:

“Figures released a year after the launch of a top-quality exercise and physiology clinic show its programme has helped hundreds of people. The first figures released yesterday from Palmerston North's U-Kinetic clinic show more than 400 referrals who passed through the clinic enjoyed improvements to their physical and mental health. And, as clients, clinicians and trainers turned out to hear the results, it was not the numbers that spoke volumes but rather the slim figures of the people in the room that said more. U-Kinetics is a wellness programme focusing on exercise treatment, formed last year in a partnership between the MidCentral District Health Board, UCOL and other primary health providers. It has provided employment for UCOL exercise and sport science graduates and supported a new qualification in clinical exercise physiology, with onsite training. UCOL's associate professor in health science, Lukas Dreyer, said the concept helped people improve their condition through lifestyle changes and lessen their reliance on the health system.” ...

CURRENT U-KINETICS RESEARCH PROJECTS BASED ON CLINICAL SERVICES

Project:

Evaluation of the effectiveness of a 12 or 24 week exercise programme on measures of health and physical fitness in clients referred to U-Kinetics Te Huinga Waiora with the Cardiovascular or Respiratory Conditions or Diabetes.

Researchers:

Associate Professor Lukas Dreyer, Dr Sonja Dreyer, Shohn Wormgoor, Dean Rankin

Project:

Occupational Musculoskeletal Issues among Nurses and Radiographers in New Zealand: Physical Training to Meet Workforce Demands

Researchers:

Farzanah Desai & Dr Cheryl Murphy, Michael Mann; Marie Henderson & (Nurse Education Team, UCOL), Vicki Pratt (Medical Imaging, UCOL)

Project:

Evaluations of the effectiveness of exercise training and nutritional factors on strength, balance, physical fitness and health in older adults.

Researchers:

Dean Rankin, Associate Professor Lukas Dreyer, Dr Sonja Dreyer, Shohn Wormgoor

PhD Projects:

Shohn Wormgoor

Project: Exercise intensity and diabetic control.

Masters Projects:

Kylie Chapman

Project: Effect of a 12-week exercise program on the Spirometry values and dyspnoea scores of COPD patients

Terina McAleese

Project: Influence of physical activity on the interrelationships between aerobic fitness, mental health and coronary risk in males and females.

Leon Tahana

Project: Impact of a Clinical Exercise Physiology rehabilitation program on the fitness and exercise behaviour of cardiac patients

CLINICAL EXERCISE PHYSIOLOGY PRESENTATIONS

2014 Conference Presentations

Dreyer, L.I., Dreyer, S., Wormgoor, S., Chapman, K., McAleese, T., Rodie, S. & Jefferies, K. (March, 2014). Development of a Postgraduate Diploma in Clinical Exercise Physiology at UCOL – Course Structure and first two years of client and student feedback. ITP Sports Research Symposium: Research Initiatives in the Sport, Physical Activity & Recreation Sector. Tauranga, New Zealand.

Dreyer, L.I., Rankin, D., Dreyer, S. & Wormgoor, S. (July, 2014). Engaging with local industry as a student business venture. ITP Research Symposium: Engaging with Industry. Auckland, New Zealand.

Dreyer, L.I., Dreyer, S., Wormgoor, S. & Rankin, D. (November 2014). Clinical Exercise Physiology in New Zealand – An innovative approach to the global health challenge. International Pacific Health Conference, Auckland.

Dreyer, L.I. (December 2014). Clinical Exercise Physiology in New Zealand – Effect of a 12-week programme on the mental/cardiovascular health interrelations in cardiopulmonary patients. 2014 Service User Academia Symposium, Wellington; New Zealand.

2015 Upcoming Conference Presentations (Abstracts Accepted)

Conference:

TSANZSRS Annual Scientific Meeting 2015

The Annual Scientific Meeting for Leaders in Lung Health & Respiratory Science, Gold Coast, Australia (March 2015)

Abstracts Accepted:

- Dreyer L.I., Dreyer S., Wormgoor, S. & Rankin, D. Chronic pulmonary disease: Grip strength, and impaired physical function
- Dreyer L.I., Dreyer S., Wormgoor, S. & Rankin, D. Clinical exercise physiology in New Zealand - Effect of structured exercise on health and well-being of COPD patients
- Dreyer, L.I., Chapman, K., Dreyer, S., Wormgoor, S & Rankin, D. The impact of disease severity, peripheral muscle strength, and activities of daily living on arm and leg ergometry in patients with Chronic Pulmonary Disease

Conference:

NZACE (New Zealand Association for Cooperative Education) Conference -
Cooperative Work-Integrated Education. Wellington, New Zealand (April, 2015)

Abstract & Paper Accepted:

- Dreyer, L.I., Chapman, K., Dreyer, S., Wormgoor, S & Rankin, D.
Engaging with local industry as a student business venture

A number of academic journal articles are currently under development for submission to New Zealand and International Journals in 2015 and 2016.

TRANSITION INTO POSTGRADUATE DIPLOMA IN CLINICAL EXERCISE PHYSIOLOGY FOR HEALTH PROFESSIONALS

To support the transition of degree qualified health professionals into the Postgraduate Diploma in Clinical Exercise Physiology, UCOL has developed two Training Schemes⁴ to provide graduates of non-exercise science courses with the required knowledge and practical skills related to exercise testing and exercise prescription for entry into the Postgraduate programme.

CERTIFICATE IN PHYSICAL CONDITIONING FOR HEALTH

Level: 7
Credits: 35

Paper Aim:

To provide students with the necessary skills to screen clients, carry out and report the results of body composition, flexibility, and sub-maximal predictive tests, and to apply results, and principles of training, to exercise programme design to achieve physiological adaptations. To provide the student with the clinical knowledge of considerations for exercise testing, exercise prescription, and nutritional considerations, for special population groups.

This Training Scheme is proving to be a very effective pathway for internationally qualified health professionals to pathway into the Postgraduate Diploma in Clinical Exercise Physiology. The first cohort of international students started the Certificate in Physical Conditioning for Health in August 2014 and since then we have now had six international students use this pathway in the Postgraduate Programme.

One international student from India was also successful in gaining one of the New Zealand-India Sports Scholarships – *see article on next page*.

⁴ A Training Scheme is defined as ‘study and training that leads to an award but does not, in itself, lead to a qualification listed on the New Zealand Qualifications Framework (NZQF)’. A training scheme can be at any NZQF level and can provide a range of academic or vocational learning opportunities. (NZQA, www.nzqa.govt.nz).

Palmerston North the destination for sports scholar

Manawatu Standard Article, 24/12/2014

<http://www.stuff.co.nz/manawatu-standard/news/64441052/Palmerston-North-the-destination-for-sports-scholar>



DAVID UNWIN/Fairfax NZ

Mehareen Fathima M Nishandar from India chose Palmerston North to study after being selected as one of 10 recipients to be awarded New Zealand-India Sports Scholarships.

Mehareen Fathima M Nishandar made the move from Navi Mumbai to Manawatu for an international education.

The 23-year-old was one of 10 Indian students to earn New Zealand-India Sports Scholarships to study in New Zealand, covering course fees, student levy fees and \$15,000 for extra costs.

Nishandar is studying a three-month Certificate in Physical Conditioning for Health at UCOL in Palmerston North, which will lead on to a Postgraduate Diploma in Clinical Exercise Physiology starting next year.

Nishandar became interested in the industry after tracking her mum's progress following a cycling accident where she crashed and tore her meniscus, in her knee.

"I found it really interesting how she progressed from not being able to walk to being just fine through physiotherapy," she said.

"That got me attracted to it, but now getting to rehabilitate people, help them get back to their feet and back to their day-to-day lives is the rewarding part."

She completed a bachelor's degree at K J Somaiya College of Physiotherapy at the Maharashtra University of Health Sciences in Nashik, India, last year and decided to apply for the scholarship to further herself.

"I found UCOL and U-Kinetics and thought it was a really good thing," she said.

"It's a new course and a new concept that basically focuses on prevention of diseases."

U-Kinetics is home to New Zealand's emerging clinical exercise physiology qualification, hosted in what UCOL claims to be the country's only purpose-built, state-of-the-art clinic of its type.

Only a handful of the country's tertiary education providers are offering courses in clinical exercise physiology as it's an area of the health science curriculum still finding its feet - that was what attracted Nishandar to pick Palmerston North for her study destination.

"This is one of the first countries to have a clinic like this with this setup," she said.

"In India we don't have such systems or even the clinical exercise physiology field whereas the equipment here is really nice and more advanced and the people here are more educated and experienced, especially in the field of physiotherapy."

After completing her study Nishandar hopes to stay in New Zealand and work as a clinical exercise physiologist with a sports team or at a facility to gain some experience before starting her masters.

"I really like it here," she said.

The New Zealand-India Sports Scholarships programme is one of the several activities under way to deepen New Zealand's education relationship with India.

The programme was first announced as part of the Prime Ministers' Education Initiative, which seeks to enhance bilateral tertiary education co-operation between New Zealand and India.

Manawatu Standard

We have also developed a second Training Scheme to provide students with the knowledge and practical skills related to Musculoskeletal Exercise Rehabilitation. This covers content in this area that is covered within our Bachelor of Exercise & Sport Science degree.

CERTIFICATE IN MUSCULO-SKELETAL EXERCISE REHABILITATION

Level: 7
Credits: 25

Paper Aim:

To develop an understanding of the mechanism, assessment and treatment of musculoskeletal injuries. To provide students with advanced knowledge and skills to develop comprehensive musculoskeletal reconditioning programmes and be able to clinically assess the client's progress during the rehabilitation process.

This second training scheme would also support students for entry into the Postgraduate Diploma in Clinical Exercise Physiology; however completion of the Certificate in Physical Conditioning for Health would be the minimum requirement. UCOL has NZQA approval to deliver these training schemes as accredited programmes.

These Training Schemes could also be used to provide health professionals with basic knowledge and practical skills related to exercise testing and prescription to support their current health roles.

REGISTRATION OF CLINICAL EXERCISE PHYSIOLOGISTS IN NEW ZEALAND

We are continuing to actively support the new Society “Clinical Exercise Physiology New Zealand (CEPNZ)” which is currently finalising registration requirements to be a registered as a Clinical Exercise Physiologist and working to advocate the role of a Clinical Exercise Physiologist in the New Zealand health system. The target for implementation of the registration system will be in place by the end of August, 2015. The accreditations standards document has been out to both members and through the wider health sector for feedback. Changes have been made within the document and this is in the process of being ratified by the CEPNZ Board. Further information CEPNZ, their Board, and registration standards can be found at www.cepnz.org.nz. An official launch of the registration system is due before the end of August.

A registration system that is recognised within the health sector is essential to ensuring that exercise professionals working with at risk clients have the knowledge and skills to be able to do this safely and ensure that their exercise programme meets both their individual needs and accounts for their medical conditions and/or any musculoskeletal conditions.

As the results from the delivery of clinical exercise programmes within the UCOL U-Kinetics facility, the benefits to clients from access to this new health professional are significant.

CLINICAL EXERCISE PHYSIOLOGY COLLABORATION & SERVICES IN OTHER AREAS

We are currently working to strengthen the collaboration with the other health exercise services providers within the Manawatu region – the Physical Activity Educators at the Central PHO and the Sport Manawatu Green Prescription programme. This ensures that referrals that do not our entry criteria can be sent on to other exercise providers and we are also looking to pathway clients onto the Green Prescription programme after completion of their U-Kinetics programme.

UCOL is currently working to further develop the model of delivery at U-Kinetics to ensure the sustainability of this venture either linked to education or as a stand-alone clinical exercise delivery service. Recognition of the role of a Clinical Exercise Physiologist, and the impact that they can make on the health and wellbeing of their clients, by health funders will certainly support the establishment of this profession within the health and rehabilitation industries.

UCOL is also exploring the potential for the U-Kinetics model to be extended into other areas and to delivery clinical exercise physiology services within other settings, through collaboration with other medical and health professionals. Over the past two years we have supported initiatives within the UCOL region through providing guidance for others exploring the delivery of exercise programmes for people with medical conditions.

Part 2: Role of a Clinical Exercise Physiologist in Aged Care



Background:

This project is following up on a previous Lavender Blue Demonstration Site project for HWNZ where Home Support workers were provided with basic exercise knowledge to deliver a programme to improve balance in individuals receiving home support services.

A pilot programme was conducted in 2011 at Lavender Blue to explore the effectiveness of Trainee Rehabilitation Associates in home care in Palmerston North. This pilot project involved training home care workers in the basics of strength training for older adults by a physiotherapist, with an exercise component then being added to part of their home care. A total of 31 clients participated in this programme (with 42 in control group) and 8 support workers. The programme was based around the Otago Exercise Programme, which is a home based falls prevention programme, and mainly focused around training of the lower body. The role of the TRA's was summarised more as an assistant role – where they just ensured the programme was undertaken rather than playing an active role in its delivery. Assessment included the Falls Efficacy Scale (FES), the Groningen Activity Restriction Scale (GARS - activities of daily living). Significant differences were found between the control and intervention group regarding FES and Basic Activities of Daily Living (BADL) section of GARS. No changes were found in the Instrumental Activities of Daily Living (IADL), which they indicated were not expected as the exercise programme was based on a lower body exercise regime. This pilot programme highlighted the importance of TRA's having the ability to adapt the programme to ensure on-going improvements subject engagement with the programme. The assessment of changes in physical function was also limited within this study.

As a follow up from this study, the overall goals of this project are:

- Development of a home based assessment testing protocol that can assess physical function and fitness within older adults. These assessments would be conducted by a Clinical Exercise Physiologist, with potential in future to form an addition to the current InterRAI Assessment.
- Determine whether Home Care Workers with training in exercise science (exercise technique and prescription), under the direction of a Clinical Exercise Physiologist, could improve client outcomes in terms of physical function and fitness, self-sufficiency related to Activity of Daily Living and reduced requirement for home care support.

In this case, the project is examining whether having home support workers with exercise knowledge could improve the outcomes for a home based exercise programme. In addition, while a major focus of the project is around improving balance, a focus is also on a full-body approach to improve aspects of functional strength, flexibility and balance – all factors that play a key role in maintaining an individual's independence and on the prevention of fall in this older and functionally impaired group.

Home Support Workers (with Exercise Background)

Selection of Home Support Workers:

Students were selected from within the UCOL Bachelor of Exercise & Sport Science degree programme in Palmerston North. Students were invited to put forward their expression of interest and were invited to an information session outlining what would be required of the role of a rehabilitation assistant (i.e. mix of home support and exercise supervision). Following this, interested students were interviewed by Lavender Blue to determine their suitability.

Orientation of Home Support Workers:

To orientate the students towards the job requirements, the students undertook the following:

- 3 hour orientation with Melissa Loumachi (CEO Lavender Blue) – this provide an overview of the role and functions of Lavender Blue. Following this, the students completed the Lavender Blue Orientation Handbook at home.
- A session with the Lavender Blue Occupational Therapist from Slow Stream Rehab in Levin, accompanied with a day out at this facility where they had the opportunity to see rehabilitation of people who have had strokes.
- On Job Training with experienced Lavender Blue Support Workers

- Support from the Lavender Blue Trainer when they went out to provide support to the client for the first time.
- Students also worked towards, and completed, the National Certificate in Community Support Services (Level 2) as part of this process.

Role of the Clinical Exercise Physiologist

Vivienne Amey performed the role of the Clinical Exercise Physiologist for this project. Viv is a graduate of the UCOL Postgraduate Diploma in Clinical Exercise Physiology and the Bachelor of Exercise & Sport Science degree, and with experience working as a Clinical Exercise Physiologist at U-Kinetics *Te Huinga Waiora* providing exercise testing and exercise training for clients across a wide range of ages and medical conditions.

Her role in this project is to undertake the initial and follow-up exercise testing, develop the core programme for each individual (what is individualised to each client and their health status), and to follow up with home support workers who are supervising clients exercising and monitoring progress. In establishing this role, Viv has worked closely with Lavender Blue regarding understanding their organisational goals and outcome focus, and establishing processes for client hand over to home support workers and on-going follow-ups.

Role of the Exercise & Sport Science Student:

The role of the student was to provide the clients with their exercise programmes and supervision, in addition to providing an aspect of their home support as employees of Lavender Blue. Exercise programmes were developed by the Clinical Exercise Physiologist and reviewed with the student before delivered to the client. As part of the supervision, the student monitored the client's responses to exercise, their technique, and their progression over the period of the exercise intervention. Students reported feedback to the Clinical Exercise Physiologist, who adapted the programme, with students also able to vary the exercises to ensure boredom with the programme was not an issue.

Due to student availability only 2 students ended up completing the orientation and working with clients. As a result of this, the service period was increased to ensure all clients who expressed interest in being part of this trial could receive the full period of training by the students.

Exercise Testing & Questionnaires:

Exercise testing takes place at the start and after completion of the 8 week exercise programme. Exercise Testing involves a range of measures that aim to determine the health and functional status of the individual. It is important to note that due to the age of the clients

involved in this project there will be a range of medical conditions and functional issues present within this population group. This is why it is essential to have a Clinical Exercise Physiologist, with experience exercising people with medical conditions and injuries, undertake the initial assessment is important. Exercise testing for this project involves the following:

- Questionnaires
 - Wellness (SF-36 Questionnaire)
 - Balance (Falls Efficacy Scale (FAS))
 - Activities of Daily Living (Groningen Scale)
 - Mini Nutritional Assessment
- Functional Testing
 - Berg Balance Scale
 - Grip Strength
 - 5 Time Sit to Stand Test
 - Get up and Go Test
 - Body Composition
 - Height & Weight
 - Waist & Hip Circumference
 - % Body Fat
 - Resting Blood Pressure & Heart Rate
 - Blood Pressure and Heart Rate Changes from Sitting to Standing
- Other information Recorded:
 - Current Medications
 - Medical Conditions (co-morbidities)
 - Fracture History
 - Smoking History

Client Selection:

Client Recruitment:

Clients were recruited through Lavender Blue for this project. An overview of the project was sent out to current clients receiving Lavender Blue services for the select of both the exercise intervention group and the control group.

Inclusion / Exclusion Criteria:

Subjects were recruited by Lavender Blue Nursing and Home Care Agency Limited. As per the original Lavender Blue trial, clients must:

- Be free of cognitive impairment

- Be eligible to receive the equivalent of 10 hours or less per week of home support
- Be over the age of 65 years of age
- Be able to engage in an exercise programme (medical clearance may be required)

Clients were provided with an information sheet regarding the project, given a chance to have any questions answered about the project, and also signed an informed consent prior to participate in this project to ensure they were fully aware of what their participation involved.

Exercise Programme

General Aims of Exercise Programme:

- Improve Balance and Stability (reduce falls risk)
- Improved Functional Capacity for Activities of Daily Living
- Improved Upper Body Strength & Function

With the overall aim of developing basic skills for on-going self-management of exercise for maintaining activities of daily living (i.e. ability to continue with exercises after completion of the programme).

Exercise Testing Equipment:

- Grip Strength Dynamometer
- Scales & Height Measure
- Blood Pressure Kit
- Heart Rate Monitor
- Pulse Oximeter
- Tape Measure (Body Composition)
- Tape Measure (5m)
- Sit to Stand Chair
- Stopwatch

Exercise Equipment for Clients:

- Grip strength ball
- Exercise Bands for Resistance
- Exercise Instruction Booklet
- Exercise Programme Recording Sheet

Monitoring & Adapting Exercise Programme

Following the hand over from the Clinical Exercise Physiologist to the student, there were meetings every two weeks to follow up and review client progress. The students, had the ability to make minor adjustments to the exercise programme, in consultation with Viv Amey, to ensure both variety in the exercise programme and to ensure progress continues to be made. Any major adjustments are made following the fortnightly meetings. Viv was also accessible via email or phone if required.

Results & Discussion:

Following subject recruitment a total of 25 Exercise subjects and 15 Control subjects agreed to participate in this project. Both groups underwent the initial and post assessment after an 8 week period, with the 25 Exercise subjects undertaking the exercise programme.

For the Exercise group, a total of 21 subjects completed both the pre- and post-assessments, with 4 subjects unable to complete the repeat testing due to health issues. For the control group, a total of 13 subjects completed both the pre- and post-assessments, with 2 subjects unable to complete testing due to health reasons.

An overview of the characteristics of the two groups at the baseline testing is shown below in Table 1.

It should be noted that all clients involved in this project suffered from multiple medical conditions and health issues. The extent of this, and their associated medication requirements, are the reasons why these subjects qualify for funded home support services to allow them to continue living in their homes. Medical conditions documented for this group include a wider range of conditions, including arthritis (including osteoarthritis), Osteoporosis, Parkinson's disease, Chronic Pain, Alzheimer's, Stroke, Gout, Sciatica Glaucoma, Diabetes, Cancer, and a range of both Cardiac and Respiratory Conditions. All of this makes this a very complex group to work with in terms of the provision of safe exercise and functional assessment, and exercise programmes. The age range for this study was from 69 through until 94 years old.

Table 1. Subject Characteristics for the Exercise and Control Groups for the Lavender Blue Project.

Subject Characteristics	Exercise Group	Control Group
Number	21	13
○ Males	10	6
○ Females	11	7
Age (Years)	83.1 (± 6.1)	82.1 (± 5.6)
Age Range (Years)	69 – 94	74 – 91
Height (cm)	163.9 (± 10.1)	160.4 (± 6.3)
Weight (kg)	71.83 (± 12.5)	70.7 (± 11.9)
Body Mass Index	26.9 (± 5.0)	27.0 (± 4.9)
Resting Heart Rate (bpm)	70.3 (± 10.7)	75.1 (± 12.3)
Blood Pressure (mmHg)		
○ Systolic BP	139.1 (± 15.0)	142.1 (24.0)
○ Diastolic BP	76.0 (± 10.9)	72.5 (± 12.9)
Resting SaO ₂ (%)	94.8 (± 3.0)	94.5 (2.2)

There were no significant differences between the subject characteristics for the Exercise group and the Control group. In addition, there were not significant changes in the above variables between baseline assessment and the retest assessment.

The results from the SF-36v2 questionnaire can be seen in Table 2. At the baseline assessment of this questionnaire, results across all of the domain areas are very low for both the Exercise and Control groups, which reflects the age and health status of the population group. The SF-36v2 provides a measure of how subjects perceive their personal health and wellbeing – the higher the value for each category indicates a better health status as perceived by the subject. This questionnaire is a well validated and used tool in research related to health status.

As seen in Table 2, the exercise programme resulted in significant increases in the categories of Role-Physical, General Health and Social Functioning, with a trend for an increase in Physical Functioning. For the control group, large decreases were observed in the areas of Role – Physical and Social Functioning, with the observed decrease in Social Functioning being significant. The overall effect of the exercise programme is highlighted through the Overall Physical Health Score, which resulted in a significant increase of 8.6%, with a trend for an increase in the Overall Mental Health Score. For both of these measures the control group showed slight decreases. Comparing the baseline results for the two groups, the control group had significantly lower values for Physical Functioning and Vitality compared to the Exercise group. The control group had greater improvement than the exercise group in the three domains of Bodily Pain, Vitality, and Role – Emotional, although their average result were all lower than those observed in the Exercise group.

Table 2. SF-36v2 Questionnaire Results for the Exercise and Control Groups for the Lavender Blue Project.

		Exercise Group		Control Group	
SF-36v2 Domain		Mean	% Change	Mean	% Change
Physical Functioning					
○ Baseline	26.67	7.1%	23.36	4.5%	
○ Repeat Test	28.57		24.41		
Role – Physical					
○ Baseline	31.31	14.2%*	29.10	-11.2%	
○ Repeat Test	35.74		25.83		
Bodily Pain					
○ Baseline	43.22	-0.1%	36.55	2.5%	
○ Repeat Test	43.18		37.47		
General Health					
○ Baseline	45.38	7.4%*	40.46	-1.0%	
○ Repeat Test	48.37		40.06		
Vitality					
○ Baseline	43.47	4.1%	38.82	9.4%	
○ Repeat Test	45.25		42.46		
Social Functioning					
○ Baseline	39.97	11.0%**	41.85	-11.9%*	
○ Repeat Test	44.38		36.85		
Role - Emotional					
○ Baseline	36.81	0.0%	34.82	3.7%	
○ Repeat Test	36.81		36.12		
Mental Health					
○ Baseline	47.46	1.4%	47.19	-1.0%	
○ Repeat Test	48.13		46.72		
Overall Physical Health Score					
○ Baseline	33.22	9.2%*	27.99	-1.8%	
○ Repeat Test	36.28		27.48		
Overall Mental Health Score					
○ Baseline	47.21	1.9%	47.39	-0.2%	
○ Repeat Test	48.11		47.32		

Significant Change = * $p < 0.05$; ** $p < 0.01$

The results for the assessment of balance, fear of falling, ability to undertake activities of daily living and nutritional status can be seen in Table 3. The effectiveness of the exercise programme can be seen especially in the results for the Berg Balance Scale, where the exercise group gained a 32.1% increase in their assessment score, with the control group having a 6.6% decrease in their score. A higher score in this scale indicates improved balance and a decrease in the risk of a fall. This is an excellent result, and the effect of is seen through a slightly reduced fear of falling (as measured by the Falls Efficacy Scale) for the Exercise group. The results for the Control group showed a slight decrease in their Berg Balance Score, with and slight increase in their fear of falling. A key of any exercise programme in this age group population has to be around the prevention of falls. This improved result for balance is also reflected in the results for the Groningen Activity Restriction Scale, which measures the subjects' ability to undertake activities of daily living. In this scale, the higher the score the

greater the restriction on the subjects ability to perform these tasks. As seen in the results, a significant improvement is seen for the Basic Activities of Daily Living (BADL) for the Exercise group, with an average decrease seen for Incidental Activities of Daily Living (IADL) and the overall Groningen Score. No changes were observed for the control group. This result is very important given the desire for these subject to maintain their independence and remain living within their homes. The greater their ability to undertake these activities of daily living, the greater their ability to maintain their independence. A key driver for subjects wanting to take part in this trial was that they could identify the benefits of the exercise programme as supporting them to maintain their independence.

Table 3. Results for the assessment of balance and fear of falling, along with the assessment of activities of daily living and nutritional status for the Exercise and Control Groups for the Lavender Blue Project.

Assessment Test	Exercise Group		Control Group	
	Mean	% Change	Mean	% Change
Berg Balance Scale				
○ Baseline	31.48	32.1%**	31.30	-6.6%
○ Repeat Test	41.57		29.23	
Falls Efficacy Scale				
○ Baseline	36.81	-2.8%	37.77	2.9%
○ Repeat Test	35.76		38.85	
Groningen Activity Restriction Scale				
BADL				
○ Baseline	18.43	-6.7%*	18.08	0.4%
○ Repeat Test	17.19		18.15	
IADL				
○ Baseline	14.00	-2.0%	13.69	-0.6%
○ Repeat Test	13.71		13.62	
Overall Score				
○ Baseline	32.43	-4.7%	31.77	0.0%
○ Repeat Test	30.90		31.77	
Mini Nutritional Assessment				
○ Baseline	12.1	5.3%	11.4	4.1%
○ Repeat Test	12.7		11.9	
Subject Categories (n):				
○ Normal		n/a		n/a
○ Baseline	13		5	
○ Repeat Test	17		9	
○ At Risk of Malnutrition		n/a		n/a
○ Baseline	8		6	
○ Repeat Test	4		4	
○ Malnourished		n/a		n/a
○ Baseline	0		2	
○ Repeat Test	0		0	

Significant Change = * $p < 0.05$; ** $p < 0.01$

A key consideration for this age group is their nutritional status. The average score from this study indicates that as a group this group has normal nutritional status. However, at the baseline assessment, out of all the subjects engaged in this trial, 16 were classed as having 'normal nutritional status', 15 subjects were classed as 'at risk of malnutrition' and 2 subjects were categorised as 'malnourished' under this assessment. At the time of the reassessment, both the exercise and control group showed increases in their nutritional assessment score, with the majority of subjects moving into the 'normal nutritional status' category. Improving nutritional status was not a focus of this study, however, basic nutritional advice was provided to the exercise group to support their engagement in the exercise programme. Clients who were identified as malnourished were referred for additional support.

Table 4 below showcases the physical assessments of strength and mobility. The 5 Times Sit to Stand Test has been shown to be a good measure of leg strength and mobility in older adults.

Table 4. Results for the assessment of physical strength (five times sit to stand test) and the 'get up and go' for the Exercise and Control Groups for the Lavender Blue Project.

Assessment Test	Exercise Group		Control Group	
	Mean	% Change	Mean	% Change
5 Times Sit to Stand Test				
○ Baseline	23.68	-12.9%*	32.85	15.0%
○ Repeat Test	20.63		37.77	
Get Up and Go Test				
○ Baseline	21.4	-31.0%**	28.0	-12.6%
○ Repeat Test	14.7		24.5	
Grip Strength				
Right Hand				
○ Baseline	22.24	-0.2%	15.85	-11.7%
○ Repeat Test	22.29		14.00	
Left Hand				
○ Baseline	20.81	2.5%	15.85	-16.5%*
○ Repeat Test	21.33		13.23	

Significant Change = * $p < 0.05$; ** $p < 0.01$

The results of this trial show the exercise group improved their strength, as demonstrated through a decreased time to complete the five sit to stand repetitions. The control group showed an increase in their time for this task. Both groups also showed improvements in the Get Up and Go Test – with the improvement greatest in the exercise group. This result, along with the results for the 5 Times Sit to Stand Test, highlights the improvements in strength and mobility from the exercise programme, and supports the results of the Berg Balance Scale, which showed a large increase in balance for the exercise group. Regarding Grip Strength, the exercise group showed no real change in this over the period of the trial, with a slight increase in grip strength of the left hand. The results for the control group, however, showed a large

decrease in grip strength over this time. Grip strength is an important factor related to the ability to perform the activities of daily living. This study included upper body strength training to support this, rather than just focusing on lower body strength and balance. Grip strength was targeted through the use of grip ball (was up to clients to use as they liked) and also grip was an important factor for using the elastic bands for the exercise programme. Preventing any decrease in grip strength should be a focus of exercise programmes aimed at maintaining the independence of older adults.

Service Provision Feedback:

In order to review the effectiveness of the service provision of this exercise programme, linked to home support, feedback is documented from the following people:

- Viv Amey
 - Clinical Exercise Physiologist – UCOL U-Kinetics *Te Huinga Waiora*
 - *NOTE: Also includes feedback from clients*
- Woody Au & Rhianne Wolf
 - UCOL Bachelor of Exercise & Sport Science Students & Lavender Blue Staff
- Melissa Loumachi
 - Owner & Manager – Lavender Blue Nursing and Home Care Agency

Viv Amey

Clinical Exercise Physiologist – UCOL U-Kinetics *Te Huinga Waiora*

Qualifications:

PGDip Clinical Exercise Physiology, Bachelor of Exercise & Sport Science

Feedback:

Response from the clients she worked with were amazing. There is a huge need for this service in the community. The training that Viv completed within the UCOL Postgraduate Diploma in Clinical Exercise Physiology was all put into practice through this role working with older adults.

Complexity of Medical Conditions – a key consideration when exercising older adults. The clients on the programme had a wide range of medical conditions, all experiencing multiple conditions. Viv felt the UCOL course had trained her well to be able to work with these clients – she had a good understanding of the conditions and

considerations for safety, along with the ability to research the conditions and apply current research to her exercise prescription.

Age of Clients – a very wide range of aged (72-92 years). Clients' were inspirational – they were still at home by themselves, trying to cope by themselves to losing their independence. They all took to exercise very well. Older adults are often from an era where exercise was not a focus – however found them all open to trying. Explanations for exercises had to provide them with an understanding of why the exercise was selected and why they were doing it.

Exercise Programme – clients enjoyed the exercises, especially the focus on a total body workout (working all muscle groups). Many past exercise programmes have focused mainly on leg strength and balance, which is effective for falls prevention – this programme also focused on upper body strength and function – which plays an important role for performing the activities of daily living.

Exercise programmes were implemented slowly and at a level so as to not elicit a high level of muscle soreness. Many viewed exercise as being associated with 'pain' which was a barrier to them engaging with exercise in the past. The confidence of the clients to exercise certainly increased over the programme – with them gaining an understanding that exercise can be done safely.

Exercise Testing – clients were willing to do the exercise testing – some found the testing battery fatiguing. Some clients were difficult to weigh due to their instability. Clients overall, found exercise testing interesting, thorough and 'liked all the gadgets'. They initially didn't know what to expect from the testing, many thought they would get a programme straight away. The initial discussion prior to the testing was important to build the relationship with the client and they could see the purpose of the testing to ensuring we could exercise them safely.

Work with Trainers – with each client, Viv met with the two students to discuss the client and go over the programme. Most contact after that would be via email and would also be followed up with a meeting at least every two weeks with each student. In hindsight, the recommendation would have been for Viv to have taken the first exercise session with each client and then handed over to the student. If repeating, more time would have been spent with the students at the start to ensure they had a better understanding of all the exercises, and adaptations, before their work began with the clients. This was not a problem in this project given that these students were final year degree students who had a very good understanding of exercise technique, but would be a consideration for future projects.

Medical Clearance – subject to the initial visit from Viv, for some clients Medical Clearance was required from their GP prior to them taking part in the exercise testing and exercise programme.

Resources – an exercise booklet was developed that was left with the clients so they could be reminded of exercise technique for each exercise. This included a brief description of each exercise with an image to show someone performing the exercise. A recording form was also developed to enable monitoring of the clients programme and their exercise responses.

Client Comments about Progress:

“I am able to bend down easier & walking around the hours without the need for a walker. Use the walking stick when going out to town.”

“I feel twice as good as I did before beginning the exercise programme. Feel as though I could do the garden and go back to playing bowls.”

“I feel as though I am doing something positive” – This client is losing her sight but does not want to stop exercise as she feels it is one positive thing in her life at the moment.

Amputee Client – “Exercise has helped me to stand independently for longer when attempting everyday activities such as toilet and standing at the kitchen sink. Over the holiday period I walked around the block 3 x per week with the aid of my walker. My son also took me to the local shops and I told him I would be OK to walk home (which I did). I have progressed from 2 sets of 5 (red band) to 2 sets of 15 (green band). I can now stand independently for 40 seconds and standing on one leg for 30 seconds. This has all improved over the 12 week period.”

This client experienced arm and shoulder pain – “I can now lift arm up easier when hanging washing out. At present there is no pain at all in the arm or shoulder.”

“I am a Type II Diabetic – through the monitoring system associated with this exercise programme by Viv, it was clear that my blood glucose levels are not under control, they are very high. With the help of Viv, I was able to contact my doctor and get the necessary help.”

I wish I had met Viv 30 years ago so that she could have helped me with my condition and strength then.”

Working with both Husband and Wife – “At first the husband was unsure whether the exercise was right for him as he had never been involved in any form of exercise programme. He is now enjoying the programme and seeing the benefits. The wife comments that she finds it invigorating and that the more I (Viv) comes the more she

realises I know what I am talking about. She had a very tight Achilles which affected her walking, now they are not as tight and she is working easier.

*“For years I have just sat in the chair and brushed my hair without seeing what I am doing. Today I got a fright because I saw this person in the mirror and it was me!”
This client improved strength and confidence to sit up straighter/taller.*

“I am now walking without the aid of a walking stick around the garden.”

“I am now able to move limbs more than what I could before the exercise programme, my movement is affected by a past stroke. I have carried on with the student once the exercise programme finished.”

“My husband, who is affected by Parkinson’s, now walks down the hall looking at her face and not her stomach.

“I am able to stand more steadily in the shower, the caregiver doesn’t have to be so involved.”

“I am now walking around unaided, I am less reliant on the walking frame – I couldn’t do this 8 weeks ago.”

Woody Au & Rhianne Wolf

UCOL Bachelor of Exercise & Sport Science Students (Year 3) & Lavender Blue Staff

Worked with clients in two capacities:

- (1) Providing Exercise Sessions Only
- (2) Providing Both Exercise Session and Home Support

Feedback indicates that the relationship between the student and the client in both of these capacities were similar. Clients were all keen to take part in the exercise and they experienced no motivational issues for client to engage. Clients valued the care support that they received from Lavender Blue but saw real benefit related to the addition of exercise to this to help them improve or maintain their function and independence.

The learning experience for the students to be engaged in working with this aged group was described as a real ‘eye opener’. The possibility to work with older adults (aged 75-92) was a great opportunity – with the client described as the ‘fittest’ being in their early 90’s. The attitude of clients towards exercise improved over the period of the exercise programme, especially once they started experiencing improvements. The level of fragility in clients varied and had to be considered regarding the exercise that they were prescribed.

***“Exercise programmes need to be very individual
– not always age related”***

General feedback regarding client improvements related to increased mobility, with decreased reliance on aids (including walking sticks). Clients reported increased balance (as described by one client as being able to make a cup of tea and carry it to his wife) and ability to do more around the house. The students described the movement of the clients as becoming a lot smoother with the programme, an increased in functional capacity and the ability to get out and about.

***“One client is doing more walking now their balance is better –
legs are not as shaky”***

The social benefits of the programme are also important. Many of the clients do not get a lot of outside visitors. Exercise training provides a good basis for relationship building and social communication, along with a great way to monitor the health status of the clients.

Contact with the Clinical Exercise Physiologist was essential for the trainers throughout the programme. This provides the trainers with an increased understanding of the medical conditions they were dealing with and what to look out for. Monitoring was essential as there were daily variations in the client’s health and mobility based on their medical conditions. Contact with the Clinical Exercise Physiologist included emails and formal face-to-face meetings – with increased contact when programme was adapted based on the clients improvements. The key was to ensure exercise was performed safely.

Exercising clients of this age requires you to problem solve based on the clients health and responses, requires a strong focus on ensuring good exercise technique (clients often forgetful of technique) and ensuring you can meaningfully explain exercise information in layman’s terms so it is easily understood.

The exercise bands worked very well within the home, however, consideration should be given to (1) ensuring these can be easily attached to a secure point for use and (2) ensuring a good grip for the client. The changing of bands provided progression in resistance and also as the client improved incorporating more body weight exercise worked well. Grip balls were left with clients to use as they saw fit – this was not formally incorporated into the programme – however clients utilised these well.

The 6-8 week programme had real benefits for the client – this provided a leave of initial improvement that should be continued through ongoing support. Being able to provide an increased level of support for clients at times of need is also important – one client had good gains and became more active, unfortunately he tripped on a hose and had a fall when out in the garden. It took time for him to regain his confidence again and has returned to where he was before the fall with support. Ensuring gains are maintained is

important and support should consider how this is achieved. A range of support could be provided through phone contact, engagement of their partner with the training so they have support at home, and opportunities for taking part in group exercise should all be considered.

“Many clients were relatively independent – all saw the benefits of exercise for maintaining this independence”

In terms for their recommendations for service provision – exercise can be provided in conjunction with home support. Good knowledge of exercise and the impact of medical conditions on exercise ability and responses is important – the link to a Clinical Exercise Physiologist is essential. Every situation is different and programmes need to be individualised and specialised for each client - supervision must ensure client safety during exercise.

Melissa Loumachi

Owner & Manager – Lavender Blue Nursing & Home Care Agency

Recruitment

Initially the recruitment phase went well. Seven students signed up to do the trial. They were very positive about the goals of the trial, and were very enthusiastic about delivering the exercise component.

Orientation

Lavender Blue was responsible for the training of the students in how to deliver the personal care component of the tasks. Students were already trained in the exercise component by UCOL. The initial orientation consisted of a 3 hour classroom based session where they were presented with the basic policies and procedures including health and safety, how to provide personal cares, reporting of changes in clients condition such as skin breakdown, signs of infection, abuse and neglect, preventing falls etc. An occupational therapist then presented a 1 hour session of how to provide cares in a manner that encouraged independence, including setting functional goals with clients. Students were also given an enrolment form to complete the National Certificate in foundation skills level 2. The orientation went well and gave students more insight as to the role.

From here, 4 out of the 7 initial students were unable to proceed with the trial mainly because of their sporting commitments. 3 students commenced with the delivery phase.

Delivery

Students were assigned clients. The clients were low risk and high functioning clients who required supervision with their shower. Students were initially supervised from our staff trainer until they were deemed competent to provide the care by themselves. All were competent to deliver low level support to clients after their first training session. They were able to support the client to shower as well as assist them with an exercise program, all within the funded time. This was a very significant finding as it demonstrates that service users who have high function can still achieve the outcome of receiving their personal care requirements as well as exercise within the funded time. It was however, more difficult to support clients with lower levels of function within the allocated funded time. For the trial it was also deemed unsafe to place the student into these clients as they did not have the experience to provide the care. However if the trial had gone on longer they could have gained the experience required to safely provide care.

For clients with lower levels of function, exercises were done outside of the funded time by the Clinical Exercise Physiologist. Her level of expertise and experience from working in U-Kinetics proved extremely valuable. She was able to understand the complexities associated with clients' co-morbidities and loss of function.

The students were very popular with the clients and were able to establish rapport and respect. They were also extremely reliable and would report changes and concerns they may have had with their clients. Clients appeared to value the support and seemed to consider it as more of a therapy than a personal care service and were very focused on progressing and achieving their goals. One particular client had a goal to be able to weight bare and pivot on her feet so that she would not need to use a hoist to transfer. Before the delivery of the exercise program she was about to go into a rest home as she was unable to fit a hoist in her home. The exercises gave her enough strength to weight bare and pivot without the use of a hoist and she was able to stay in her home. Another client who was supported by a student was a very high risk of falls. During his time on the program he gained more confidence and stated he had a better quality of life.

Overall Summary:

Overall, the exercise intervention used in this project showed significant improvements in terms of a client's health and wellbeing for the following aspects:

- **Improved Balance**
 - As measured by the Berg Balance Scale
- **Improved Physical Function and Strength**
 - As measured by the SF-36v2 questionnaire, 5 Times Sit to Stand Test, and the Get-up-and-Go Test
- **Improved Activities of Daily Living**
 - An improvement in their ability to perform Basic Activities of Daily Living (BADL), as measured by the Groningen Activity Restriction Scale

The exercise programme was delivered over a relatively short time (8 weeks), with a longer period likely to have continued improvements in the clients' health and wellbeing. Feedback from clients was very positive regarding the work that the Clinical Exercise Physiologist and the Exercise & Sport Science students did with them, with clients demonstrating a real willingness to engage in exercise as a way to maintaining their independence. The significant number of medical conditions present within this group of older adults, showcases the importance of the role of the Clinical Exercise Physiologist. It also shows that there is an opportunity for upskilling home care workers to be able to facilitate, under the supervision from a Clinical Exercise Physiologist, home based exercise programmes connected to their home support services. It would have to be carefully determined what the scope of practice would be for home support workers providing exercise training support for this group of clients to ensure client safety, and what level of training this would require. This project utilised degree students who had already completed the equivalent of a Level 6 Diploma qualification in Exercise Science.

Overall, this project highlights that there is certainly the opportunity to effectively deliver home-based exercise programmes for those with impaired function or medical conditions, with the goal of both maintaining independence and minimising public health costs. Any programme needs to have an initial focused intervention to improve physical fitness and function, followed by a long-term maintenance programme. The maintenance programme also has to be flexible enough to allow for a period of more intense intervention when needed by the client.



UCOL Health Academy

In 2013 UCOL developed and delivered a Health Academy (He Waipuna Hauora) for the first time under the UCOL U-Skills Central Schools Academy (Trades Academy).

Programme Structure:

The Health Academy Structure consisted of 42 NZQA credits (40 Credits at Level 3, and 2 Credits at Level 2). Subject Areas included in the programme were Anatomy & Physiology, Nutrition, Wellbeing and Health Promotion, and Exercise. In 2014, and for 2015, the programme now consists of 40 Credits at Level 3.

Programme Aim:

The aim of the programme was to provide students with the opportunity to experience working with/within a health related field and to assist them in making an informed decision for further study and/or employment.

Programme Delivery:

The students studied onsite at UCOL in Palmerston North on Fridays during the school terms throughout the year.

Students & Completions:

For the 2013 Cohort:

A total of 17 students enrolled in the programme at the start of the year (10 students identified as Maori, 4 as NZ European, 2 as Samoan, and 1 as other). Of these, 14 students completed the programme with 10 students successfully completing all 42 credits, 4 students gaining some credits (of which 2 students completed 40 credits).

Upon completion of the programme, a number of students indicated the following plans for 2014:

- Studying at UCOL (3 in the Bachelor of Nursing, 1 in the Certificate in Science & Health)
- Studying at Other Tertiary Institutions (1 studying psychology and 1 studying tourism)
- Four students indicated they were planning to study within a health related area in 2015 (2 indicated Nursing, 1 indicated Maori Health Promotion, and 1 indicated Medic Training (overseas))
- Two students are moving overseas at the end of 2013.

For the 2014 cohort:

A total of 25 students enrolled in the programme at the start of the year. Of these a total of 9 students completed all 40 credits, with a total of 17 students completing over 70% the available credits. The overall level of course completion for the year was 77%.

Upon completion of the programme, a number of students indicated the following plans for 2015:

- 17 students indicated they were planning to go into Tertiary study
 - Programmes listed at UCOL included the Bachelor of Nursing and the Certificate in Science and Health.
- 5 students indicated they were planning on seeking employment in 2015.
- 1 student was continuing with studies at their School in 2015.

Student feedback for both 2013 and 2014 regarding this course and the lecturer was very positive with students enjoying their experiences here at UCOL. As part of the programme, students were also involved in an industry day (in collaboration with Central PHO) and also experienced Nursing, Medical Imaging and Exercise & Sport Science (including U-Kinetics and Clinical Exercise Physiology) as part of their studies.

UCOL Health Academy Programme 2015

STANDARDS	TITLE	LEVEL	CREDITS
27547	Describe the anatomy and physiology of systems and associated organs of the human body	3	4
27461	Describe indicators of wellness, interventions, care and support for people at different human lifespan stages	3	6
26971	Describe factors that contribute to mental health wellbeing and mental health problems	3	3
22237	Describe key concepts and models of injury prevention	3	3
22260	Demonstrate knowledge of human behaviour and exercise adherence	3	4
17592	Identify the causes of back injury and methods to prevent back injuries in the workplace	3	4
7021	Exercise Prescription – Demonstrate exercise techniques	3	8
13380	Recommend physical activities appropriate to the growth and development of individuals of all ages	3	3
AS91466 (Achievement Standard)	Investigate a nutritional issue affecting the well-being of New Zealand society (Achievement Standard)	3	5
Total Credits			40

2015 cohort:

In 2015, UCOL has expanded so that the Health Academy is run over all three UCOL Campuses. Estimated numbers for each campus are shown below:

- Palmerston North = 20 students
- Masterton = 8 students
- Whanganui = 15 students

Exposure to Clinical Exercise Physiology for Health Science Students

In 2013, we trialled using U-Kinetics as a placement for three (3) final year nursing students. This involved them undertaking a placement there as part of one of their 6 week placements. The students found this a valuable experience which showcased, and made them aware of, the role that exercise can play in the management of clients with health conditions. It did involve a lot of U-Kinetics staff time in order to orientate the student to the centre and also to provide some up-skilling for the students regarding the basics of exercise and supervision of exercising clients. To improve the effectiveness of this placement we are working to develop an orientation/ induction plan to prepare students for this placement as it was quite different from what they had previously experienced within their degree to date.

In addition to this, twenty (20) final semester students from the Exercise & Sport Science degree are also undergoing placements at U-Kinetics as part of their Exercise Considerations for Special Populations and Musculoskeletal Exercise Rehabilitation papers. Each student is placed at U-Kinetics for a minimum of eight hours – which showcase first-hand the role of a clinical exercise physiologist to them and also provides a ‘real life’ learning opportunity that applied the theory and practical skills they had been learning in class. Student feedback regarding this experience was excellent and played a significant role in supporting their Year 3 degree studies.

In 2014, we continued to provide opportunities for the UCOL Exercise & Sport Science students to utilise the specialised equipment at U-Kinetics and also to experience placements as part of their final semester of their degree. In addition to this, in our Year 3 Exercise for Special Populations course, we now utilise real life case study examples based on clients who have been through the U-Kinetics programme. This provides a very valuable learning opportunity for the students, and also provides them the opportunity to hear from a U-Kinetics staff member who worked with some of these clients to really understand what working with these clients are like and understand the benefits of safe exercise for this population. In 2014, we also provide the opportunity for our Exercise & Sport Science Year 2 Physical Conditioning students were given the opportunity to undertake advanced musculo-skeletal isokinetic exercise and balance testing at U-Kinetics.

Based on our experiences of the benefits of placements for our Exercise & Sport Science students at U-Kinetics, we are now including a placement for all of our Year 3 students within this facility.

Health & Wellness of UCOL Students

In Semester 2, 2013, we trialled making an exercise prescription paper available for students outside of the Exercise & Sport Science programmes. The content of this exercise prescription paper was focused around:

- Assessing personal health (health screening)
- Undertaking basic exercise testing
- Developing basis exercise programmes
- Following their programme for 6 weeks, while monitoring progress
- Writing exercise programmes for two family or friends, and monitoring progress.

For the purposes of this trial, students were given access to UCOL Exercise & Sport Science facilities (gym and testing labs) while also provided with guidance for how to adapt their programmes to meet the physical demands of the profession they were studying for at UCOL.

A total of 80 students from outside of the Exercise & Sport Science programmes took part in this trial. This included students from a range of programmes and academic levels (Foundation through to Degree), as outlined below:

- Bachelor of Applied Science (Medical Imaging)
- Bachelor of Nursing
- Bachelor of Applied Visual Imaging
- Bachelor of Information and Computer Technology
- Diploma in Furniture
- Diploma in Information & Communication Technology
- National Certificate in Security
- Certificate in Contemporary Music Performance
- Certificate in Fashion and Beauty
- Certificate in Automotive Paint and Panel
- Certificate in Advanced Computing
- Certificate in Science & Health
- Certificate in Carpentry
- Certificate in Tertiary Studies

A Moodle (web-based learning) site was established to support the students learning (including resources, worksheets and learning activities), with four face-to-face workshops run for the students:

Workshop 1: Exercise Technique & Safety

The purpose of this workshop is to ensure you are able to perform the basic resistance training exercises correctly and to provide you with a number of exercises that you can then use in the development of your exercise programme.

Workshop 2: Exercise Testing

The purpose of this workshop is to give you an understanding of exercise testing and the role it plays in exercise prescription, and to assess your own personal fitness.

Workshop 3: Exercise Prescription

The purpose of this workshop is to provide you with basic guidelines for exercise prescription and an understanding of how to apply this to developing your own exercise programmes.

Workshop 4: Vocational Exercise Recommendations

The purpose of this workshop is to gain an understanding of the physical demands and common injuries related to the profession you are studying for here at UCOL, and to learn some basic exercises you can incorporate into your training programmes to meet these demands and minimise the risk of common workplace injuries.

These workshops were run at various times throughout the week for students to attend around their other studies, with drop-in sessions also run where students could come along with any questions they might have or to get their programmes checked.

We are continuing to review how this trial went and will use this information to form the basis for the more focused approach related to the Nursing and Medical Imaging Research project.

Physical Preparation for Workforce Demands and Injury Prevention

To extend the pilot project that we undertook with UCOL students in terms of their health and wellbeing, we are now extending this to looking at how we are preparing our Health Science graduates both academically and physically for the workforce. This includes how we develop their self-management health and wellness skills.

Our initial focus for this will be on our UCOL Bachelor of Nursing and Bachelor of Applied Science (Medical Imaging Technology) degree students.

A research team has been established and a proposal have been developed to explore this.

UCOL Research Team:

Farzanah Desai (Lecturer in Exercise & Sport Science)

Dr Cheryl Murphy (Senior Lecturer in Exercise & Sport Science)

Marie Henderson (Senior Lecturer – Nurse Education Team)

Debbie Govers (Lecturer – Nurse Education Team)

The process of assessing this will include:

- Workforce Questionnaire covering aspects of health, physical activity, injury incidence and impact.
 - Separate Questionnaire for Nursing and Medical Imaging
- Assessment of Physical Workforce Demands of Nurses and Medical Imaging
- Pilot Assessment of Nursing and Medical Imaging Students
- Pilot Exercise Programme based around Meeting Physical Workforce Demands and Injury Prevention

In terms of the Pilot Assessment that will be utilised for Nursing and Medical Imaging students, an Exercise testing Battery has been developed that is based on the common movements that are associated with these two workforces and also common injuries that these workforces experience.

We are aiming to have completed the initial data collection for this project by the end of 2015, with findings presented and published in 2016.