Benefits and Evidence base for Physical Activity in Older Adults

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Aims

- Physiology of Ageing and development of Frailty
- Benefits of Physical Activity for Frailty
- Evidence for Physical Activity for Frailty

Ageing/ Frailty

- Ageing is a natural process, everyone must undergo this phase of life at his or her own time and pace (Amarya S. 2018)
- Physiological changes occur with ageing process in all organ systems, frailty is a distinctive health syndrome related to that process (Fedarko N. 2011)
- Cruz Jentoft et al 2010 define frailty as " Age related cumulative declines across multiple physiologic systems, with impaired homeostatic reserve and reduced capacity to withstand stress "
- Frailty is a global term for a multitude of issues which added together result in frailty- cumulative effect – (Rockwood 2005)


INSIDE EVERY OLD PERSON IS A YOUNG PERSON WONDERING
WTF..
WHAT THE HELL HAPPENED!

Physiology of Ageing

- Reduction in cardiac output, BP rises and arteriosclerosis develops
- Reduced lung function
- Degenerative changes in joints, skin, connective tissue, teeth
- Progressive elevation of blood glucose
- Loss of muscle mass and strength – sarcopenia
- Loss of bone density – osteoporosis
- Reduced memory and cognitive function and mood
- Deterioration in senses, i.e. hearing, sight
- Changes to bladder and bowel function
- Changes to sexual needs and performance

Sarcopenia

- "Sarcopenia is a major modifiable cause of frailty in the elderly" (Roubenoff R, 2000)
- Defined as age related, involuntary loss of skeletal muscle mass and muscle strength from the 4th decade with up to 50% loss by the 8th decade. (Walston J. 2012)
- Sarcopenia causes loss of function, disability, frailty, and is associated with increased insulin resistance, fatigue, falls and mortality. It has been associated with RA. (Landi 2012 and Giles JT 2008)
- Several cellular mechanisms are involved in the pathogenesis of sarcopenia, including mitochondrial dysfunction, altered apoptotic and autophagic signaling and trace metal dyshomeostasis. (Marzetti et al)



30 years old



50 years old



80 years old

SARCOPENIA

alamy

Image ID: 2GG6

Effects of COVID -19 on Physical Activity

- A study has highlighted the adverse effect of social isolation during the pandemic on physical activity and well being.

Walking by 52.2%

Step counts by 55.1%

Increase in sitting by 20.5%

Depression symptoms by 150%

Recommends timely interventions to reverse the consequences of decreased physical activity such as depression

(Mishra et al 2021)

Benefits of Physical Activity

- Improves cardiovascular system
- Improves lung function
- Improves flexibility, balance and reduced falls
- Reduced risk of Type 2 diabetes
- Increases muscle bulk and strength
- Improves bone density
- Improves cognition and mental health
- Improves digestive system and continence
- Improve sexual health

Benefits of Physical Activity

- Targeting frailty with physical exercise interventions can improve a persons ability to live independently (Landi et al 2014 , Wang et al 2020)
- " Exercise is the medicine to reverse or mitigate frailty, preserve quality of life , and restore independent functioning in older adults at risk of frailty " (Bray et al 2016)
- " Participation in regular, moderate physical activity can delay functional declines. " (Active Ageing WHO 2002)
- " Exercise reduces age-related oxidative damage and chronic inflammation, increases autophagy, and improves mitrochondrial function, myocine profile, insulin like growth factor-1 (IGF-1) signaling pathway , and insulin sensitivity (Angulo 2020)


GLASBERGEN
"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

Evidence for Physical Activity

In terms of modifiable influences, the most studied is physical activity, particularly resistance exercise, which is beneficial both in terms of preventing and treating the physical performance component of frailty (Angulo 2020)

Sarcopenia is a major component of frailty and can be reduced and even reversed, through resistance type exercise. (Hurst et al 2022)

Regular, moderate physical activity reduced the risk of cardiac death by 20 to 25 percent among people with established heart disease (Merz and Forrester 1997)

“Weight bearing and resistance training improve muscle mass and strengthen bone. Exercise can also improve gait, balance, coordination, proprioception and reaction time even in the very old and frail elderly people” (Siegrist M. 2008)


STRETCHING AREA
"I'M RUNNNG
FROM OLD AGE."
Ida Keeling, 100
World Record Holder
GrowingBolder.com
Photo: Courtesy Ida Keeling

Evidence for Physical Activity

- Pre and Mild Frailty
- Moderate frailty
- Severe Frailty

Evidence of Physical Activity for Pre and Mild Frailty

- Frequency of Activity

Aerobic type at least 5 days a week

Strengthening type x 2-3 times a week

Balance and flexibility type x 2 a week

- Duration

150 minutes per week, e.g. 30 minutes x 5 days

Or 75 minutes vigorous activity per week

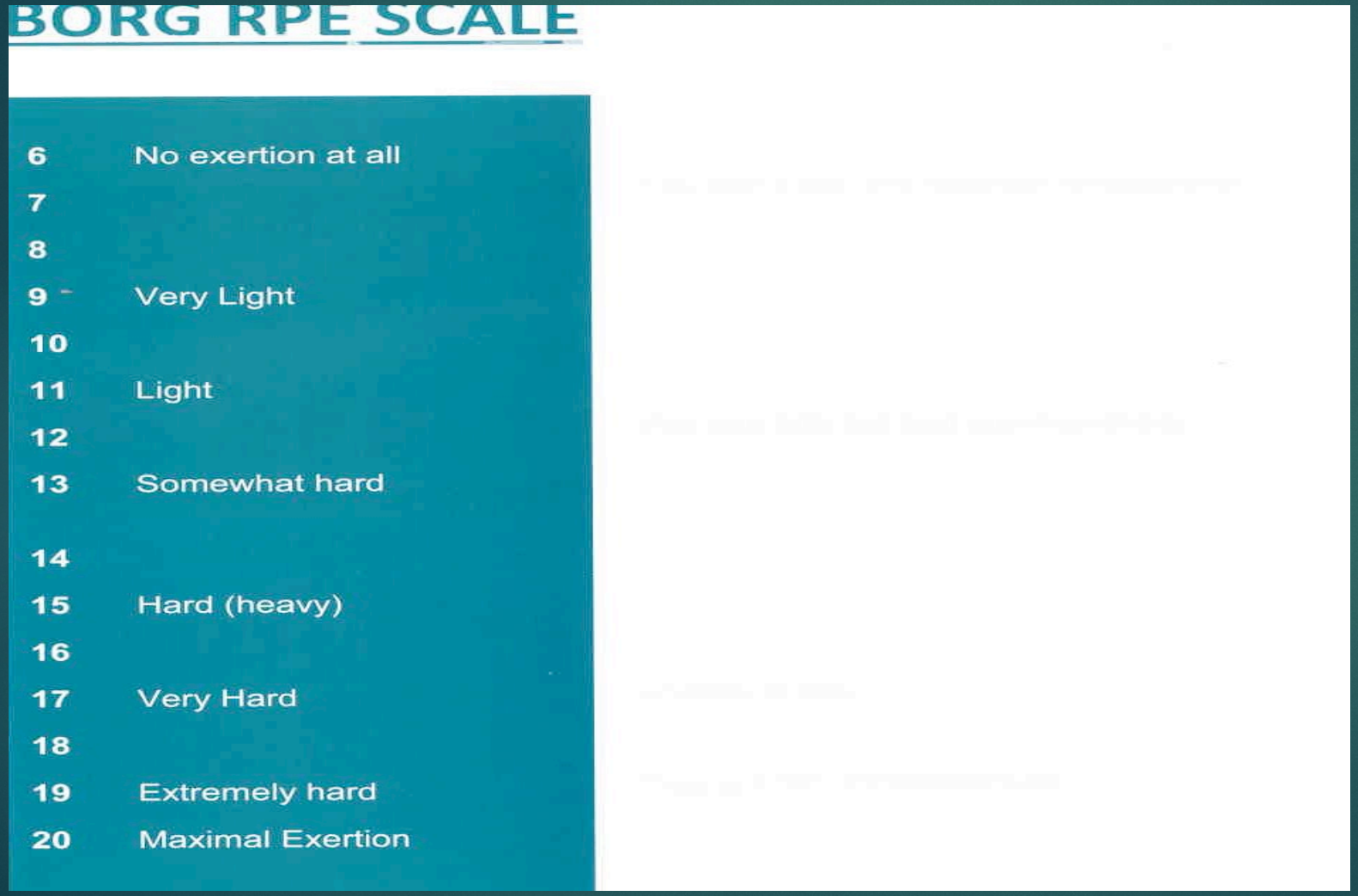
- Intensity

Moderate intensity (12-14 on Borg Scale) somewhat hard

The Talk Test

UK Physical Activity Guidelines 2022

BORG RPE SCALE





Types of Activity/ Exercise

- Each type improves different aspects of physical functioning and can be combined according to need and prescribed as a multicomponent intervention

Strengthening

Endurance

Balance

Flexibility

- (Angulo 2020)

www.getactiveabc.com/outdoorsPhysical Activity | Southern Health & Social Care Trust (hscni.net)

www.armaghbanbridgecraigavon.gov.uk/exercise-relaxation-videos

Strengthening

- Mechanical load induced by exercise training , increases muscle mass, produces mechanical stress in the skeleton and enhances osteoblast activity (Siegrist M. 2008)
- Need to work all major muscle groups, and have a progressive regime (Ram Hong A et al)
- Involving upper and lower body muscle groups, relatively high degree of effort with 6-12 repetitions for 1-3 sets. (Hurst et 2022)
- Stronger my way | The Chartered Society of Physiotherapy (csp.org.uk)

Strengthening

Resistance type exercise/activity (Virgle et al 2019)

Examples –

With weights (weight machines or free weights)– 10 RM

Resistance band exercises

Body weight i.e. push ups/off wall, squats/sit to stand

Hiking, climbing stairs

Gardening, digging

Cycling

Out door gyms

To make your own weights:

Fill an empty container with water

1 pint = 0.6kg

2 pints = 1.1 kg

3 pints =1.7kg

Sand or gravel give heavier weights

Weigh on kitchen or bathroom scales as required



Endurance

- Aerobic (30 minutes at Borg scale 12-14)

walking to local shops, dog, walking group

Dancing

tennis

jogging

bowling

housework

swimming, aqua aerobics

low impact exercise classes , over 50s clubs in leisure centres

Cycling

Nordic walking

Get running with Couch to 5K - NHS (www.nhs.uk)



Balance and Flexibility

- Balance activities

Tai-Chi

Pilates

Wobble boards

Ball games and racquet sports

- Flexibility activities

Yoga

Safe stretching exercises

Aerobics classes involving active stretches, i.e. Zumba



Risks from Physical Activity

- Advice for people experiencing common symptoms in regards to physical activity

1. MSK pain
2. Fatigue
3. SOB
4. Cardiac chest pain
5. Palpitations
6. Dysglycemia
7. Cognitive impairment
8. Falls and frailty

Risks from physical activity - Moving Medicine

Precautions

- Always warm-up and cool down before and after activity
- Wear loose , comfortable clothing and supportive, non slip shoes such as trainers.
- Have eaten lightly (but wait at least 1 hour after a meal to exercise)
- Drink plenty of water before, during and after exercise.

When to Stop

- Pain of heaviness in chest
- Dizzy or sick
- Clammy or cold
- Increasingly wheezy or tight – chested
- Unusual pain in joints or muscles
- Abnormally tired or fatigued

Advised to seek medical advice if experiencing any of above (BLF)

Evidence for Physical Activity for Moderate Frailty

- " Structured exercise training has a positive impact on the frail older adults and should be used for the management of frailty " Theou et al 2011

- Consider use of screening (Pre-exercise assessment due to potential co-morbidities) and supervised exercise classes

Falls Clinic and strength and balance classes

Cardiac rehab phase 3 and 4

Respiratory team and Pulmonary rehab classes

Type 2 diabetes clinic and exercise classes

Day hospital rehab

Physical Activity referral schemes



Extra precautions for moderate frailty

- *Do you have any contraindications to types of exercise for people with a cardiac history that would be helpful for them to know?*

- No Swimming- puts up blood pressure and heart rate- high level of fitness is required before resuming.
- No steamrooms, Jacuzzis, saunas, hot tubs – high temps lower bp
- Need to be very careful with heavier gardening tasks such as pushing a lawnmower, chainsaw, digging, hedge cutting- anything where arms are used a lot especially at shoulder height or above are much more demanding

J Montgomery cardiac rehab physio SHSCT

Risks from physical activity - Moving Medicine

Extra precautions for moderate frailty

- Slow progressions with resistance exercises
- Start with shorter duration i.e 10 minutes each day and then build up to 3 x 10 minute sessions per day or 2 x 15 minutes and gradually achieve 30 minutes x 5 days a week (BLF)
- In presence or risk of OP, care with movements that twist and flex the spine and avoid high impact weight bearing activities i.e. jogging, jumping, skipping. (Hong R. 2018)

Disability and Frailty

- Those with disability are at more risk of developing frailty, as they are more likely to be inactive. (Fried 2004)
- May need adaptations to achieve adequate activity levels

Such as ramps, low kerbs, disabled access, walking aids, appliances and joint supports, use of hand cycles , 4 wheeled buggies in forest parks, wheelchair basketball, gardening with raised beds

- Adequate pain relief/ optimise symptom control

Evidence for Physical Activity for Severe Frailty

A study by Bridget Ryburn et al (2009) looked at enabling independence in home care including physical therapy and found improved QOL, functional status and reduced costs.

Greco et al (2021) showed an increase in frailty in nursing home survivors of COVID-19 compared with non infected residents.

The adult with severe frailty may be house bound or in a nursing home,

Consider referral to

Rehab teams,

Integrated care teams

CST and respiratory teams

Rehab wards

For individual assessment and development of home exercise programmes. Families and carers can support this

Extra Precautions with Severe Frailty

- With severe frailty , there is a higher risk of adverse reactions to interventions including increasing activity levels
- Start increasing activity levels at a low level and very gradually progress
- Monitor closely for adverse effects and adapt activity programme accordingly
- Ensure management of comorbidities are optimised and person is medically stable
- Thorough assessment and identify needs and develop an individualised plan focusing on improving or maintaining function

(Skelton et al 2018)

Summary

▶ Pre and mild frailty	Provide advice re type, frequency, duration and intensity of physical activity
▶ Moderate frailty	Screen for co-morbidities Support individual in structured activity/exercise classes
▶ Severe frailty	Individual assessment and tailored activity programme. Focus on function Family and NH staff to support

Conclusion

- We need the health and exercise community to stress the importance of strength activities and plan appropriate programmes and interventions, to ensure that more people reap the benefits of an active and healthy lifestyle (Cavill 2018)
- Physical activity is much easier to sustain if its enjoyable and is incorporated into daily life to become a habit. (SHSCT Website Physical Activity)
- " We don't stop playing because we grow old; we grow old because we stop playing " G.B Shaw (1856-1950)



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WHO Active Ageing : A Policy Framework 2002

Wang et al " Muscle mass, strength, and physical performance predicting ADL. A Meta analysis" J Cachexia Sarcopenia Muscle 2020 11(1): 3-25

UK Physical Activity Guidelines GOV.UK: Updated 10 March 2022

Virgle A. et al " Resistance Training for Older adults : Position statement from the National Strength and Conditioning Association" NSCA 2019

Useful Links

- www.getactiveabc.com/outdoors
- Physical Activity | Southern Health & Social Care Trust (hscni.net)
- https://www.armaghbanbridgecraigavon.gov.uk/exercise-relaxation-videos/
- https://www.youtube.com/channel/UC-CDnFgWhceUVp_HwOsXDuA
- Stronger my way | The Chartered Society of Physiotherapy (csp.org.uk)
- Get running with Couch to 5K - NHS (www.nhs.uk)
- Risks from physical activity - Moving Medicine

Physical Activity referral scheme





WHAT IS THE
PHYSICAL ACTIVITY
REFERRAL SCHEME

The scheme offers specialised exercise and activity programmes for people diagnosed with a variety of medical conditions. The activity programmes are facilitated by Registered Fitness Professionals, who are qualified to cater for special populations.

The scheme facilitates conditions such as cardiac disease, diabetes mellitus, obesity, mental health conditions and musculo-skeletal disorders, to name a few. Clients can only be referred onto the scheme by their GP, Practice Nurse, Consultant Dietician or Physiotherapist.

FIT & WELL PROGRAMME

The Physical Activity Referral Scheme's Fit & Well programme comprises an initial health assessment, interview and induction followed by 8 weeks of scheduled, supervised physical activity sessions based on two sessions per week, and a further 4 weeks of unsupervised fitness suite usage. Supervised sessions take place in a small group environment with a dedicated instructor throughout.

On completion of the programme, clients are invited to attend a second health assessment and interview to ascertain how much progress has been made. Physical activity sessions, prescribed according to ability and personal preference include specially designed studio or outdoor classes, fitness suite usage and other activities besides. Continuation classes after the programme are also made available to encourage adherence to the physical activity routine.

Please see over leaf for Centres facilitating the Fit & Well programme across the borough.

Referral to Community Strength and Balance Classes

(Orchard Leisure Centre, Armagh /Newry Leisure Centre /Cascades, Portadown/ Dungannon Leisure Centre/ Banbridge Leisure Centre)

Patient Details:	Client Consent: Yes ☐ No ☐
	GP Details:
DOB:	
Telephone Number:	
	H&C Number: Click here to enter text.
Date of Referral:	
Venue Choice:	

Data for Collection	Question	Brief Description
Falls History	How many falls has client had in the last year? Can they explain why they fell on each occasion?	
Feeling of Dizziness	Does client often feel dizzy or light-headed?	**YES** ☐ **NO** ☐

MEDICAL PROBLEMS	NO	YES	DETAILS
Cardiac problems			
Respiratory problems			
Diabetes (insulin/ diet controlled)			
Arthritis			
Osteoporosis			
Fractures			
Joint replacements			
High or low blood pressure			
Stroke			
Parkinson's Disease			
Visual problems			
Hearing problems			
Epilepsy			
Any other conditions that may affect ability to exercise			

Signature: Name Printed:

Designation of Referrer: Contact Number:

FOR OFFICE USE ONLY

Falls Co-ordinator Screening	DATE
Identified problems relating to exercise class	
Action plan	
Name, Designation and signature	

Strength and Balance Instructor	DATE

Falls Team Co-ordinator, Mullinure Please email to Falls.Coordinator@southerntrust.hscni.net Hospital, Loughgall Road, Armagh Tel: 02837564909

COMMUNITY RESPIRATORY TEAM REFERRAL FORM

Title Mr / Mrs / Miss / Ms Surname	First Name	GP Name	GP Tel No:
Address Postcode	Date of Birth / / Male ☐ Female ☐	GP Surgery Address	
Tel No	HCN:	NOK:	NOK Tel No:

ACCEPTED: **COPD, BRONCHIECTASIS, ILD/PULMONARY FIBROSIS, OXYGEN ASSESSMENT**

Urgent / Routine 1-2 weeks / 4-6 weeks **Please telephone team with urgent referrals**	Reason for Referral: Long term Disease Mx ☐ Prevention of Admission ☐ Pulmonary Rehab ☐ Oxygen Assessment ☐

Referral to Oxygen Service Must Complete: (non- respiratory conditions accepted for O2 Assessment)
COPD ☐ Pulmonary Fibrosis ☐ Bronchiectasis ☐ OSA ☐ Heart Failure ☐ Palliative ☐ Neuromuscular ☐
Other Please state_____
Has current treatment been maximised? Yes No
Is patient without exacerbation 5-6 weeks? Yes No

Confirmed / unconfirmed (select) Respiratory Consultant known to: _____	Presenting condition/reason for referral: ***Patients with neurological condition need referred to respiratory consultant first:*** *Date referred*: _____
SpO2: % R/A or O2____ Resp Rate: B/P: Pulse: Temp:	Past medical history:
Nebuliser Yes ☐ No ☐	Oxygen: Concentrator ☐ ___L/min Cylinder ☐ ___L/min
Relevant medication:	

ABG: RA/ _____O2 pH: PCO2: P02: HCO3: BE:	WBC: CRP: CXR:	FEV1: actual: _____ L, _____%pred FVC: actual: _____ L, _____%pred FEV1/FVC ratio: _____% Smoking status: Yes / No / Ex If ex-smoker for how long:

Referrer: Print Name:		Signature:	
Designation:		Contact Tel No:	
Referrer Address/email			

AREA	Telephone No	Mobile No	Email
Craigavon & Banbridge	028 3831 1168	0746 449 3672	copdcb.referrals@southerntrust.hscni.net
Armagh & Dungannon	028 3756 4935	0746 449 3950	copdad.referrals@southerntrust.hscni.net
Newry & Mourne	028 3083 8283	0746 449 3951	copdnm.referrals@southerntrust.hscni.net

Southern Health and Social Care Trust

COMMUNITY RESPIRATORY TEAM REFERRAL GUIDELINES

The Community Respiratory Team will assess each client for suitability for the service

Service Area	Inclusion Criteria	Exclusion Criteria
Long Term Disease management includes: - High risk of re-exacerbation - On Long-term Oxygen Therapy. **Exacerbation Management** includes: - Acute exacerbation - Chest infection - Prevention of admission	Diagnosis of: • COPD • Bronchiectasis • Interstitial Lung Disease Confirmed by Spirometry / CT scan Spirometry results to be sent with referral	• Those without a respiratory diagnosis will not be accepted • Severe acute asthmatics • Neurological patients • Patients with haemoptysis • Severe hypoxia • Haemodynamically unstable / Tachycardia (>120bpm) • Acute type 2 respiratory Failure • Impaired consciousness • Suspected lung cancer or TB • Acute Pulmonary oedema • Social issues or needs unable to be meet in community
Pulmonary Rehabilitation	Diagnosis of: • COPD • Bronchiectasis • Interstitial Lung Disease Confirmed by Spirometry / CT scan. Spirometry results to be sent with referral FEV1 ≤ 50% pred +/- MRC ≥3.	• Activity limited by locomotor problems or cognitive impairment. • Apathy/ not motivate. • Unstable Angina or decompensated Heart Failure. • Embolism or MI within the past 6 weeks. • 2nd or 3rd degree heart block • DVT at present. • Contraindications: • Metastatic cancer • Unstable asthma • Unstable hypertension • SpO2 <90%

REFERRAL TO MULLINURE DAY HOSPITAL

028375 64907

PATIENT NAME & ADDRESS	DATE OF BIRTH	AGE	MARITAL STATUS (TICK)	
			MARRIED	
			WIDOWED	
	UNIT NUMBER		SINGLE	
	H&C NUMBER		LIVES ALONE	(TICK)
			YES	
PATIENT CONTACT TEL NUMBER	HAS PATIENT BEEN INFORMED		NO	
	OF REFERRAL (TICK)			
	YES NO			

REASON FOR REFERRAL

MEDICAL HISTORY

MEDICATIONS

PLEASE INDICATE CURRENT MOBILITY (TICK)				
INDEPENDENT			WALKS WITH ZIMMER/ROLLATOR	
WALKS WITH HELP OF 1			WAKLS WITH HELP OF 2	
WHEELCHAIR			OTHER	

SIGNATURE OF PERSON MAKING REFERRAL		Print Name
DESIGNATION OF ABOVE		
G.P. OR CONSULTANT		
DATE OF REFERRAL		