Community-based Prehabilitation
Community-based Prehabilitation
• Concept

• Rationale for change

• Facilitating change and The South Tees PREPWELL experience
Concept
The perioperative period

Adapted from: Clegg et al. Frailty in elderly people. Lancet. 2013; 381 (9868): 752-762
The perioperative period

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Rationale for change
Perioperative patient outcome

Patient-related
- Co-morbid disease
- Lifestyle factors
- Engagement

System-related
- Inefficient pathways
- Target driven
- Fragmented services

Healthcare professionals
- Education
- Practice
- Silo-working
Amenable ‘target’ factors

Lifestyle factors
- Inactivity
- Smoking
- Alcohol excess
- Nutritional imbalance

Health Conditions
- Anaemia
- OSA
- Frailty
- Multimorbidity
- Cardio-respiratory disease
Amenable ‘target’ factors

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Silo-working
Lifestyle guidance recommendation

![Bar chart showing hazardous drinking and activity recommendation categories with primary and secondary recommendations.](chart.png)
Perioperative patient outcome

Healthcare professionals
- Education
- Practice
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Patient-related
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System-related
- Inefficient pathways
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- Fragmented services
NOT FIT FOR PURPOSE!!
Facilitating change
To change this........

Perioperative patient outcome

Healthcare professionals
  - Education
  - Practice
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Patient-related
  - Co-morbid disease
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System-related
  - Inefficient pathways
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  - Fragmented services
To change this.........

Engagement of:

- Patients
- Healthcare professionals across sectors
- Managers
- Commissioners

- Patient-related Co-morbid disease Lifestyle factors Engagement
- System-related Inefficient pathways Target driven Fragmented services
- Healthcare professionals Education Practice Silo-working

Perioperative patient outcome
To change this........

Engagement of:

- Patients
- Healthcare professionals across sectors
- Managers
- Commissioners

Create:

- Shared learning platforms
- New care models – from existing successful services
- Culture of integrated working

Healthcare professionals

Education
Practice
Silo-working

Patient-related
Co-morbid disease
Lifestyle factors
Engagement

System-related
Inefficient pathways
Target driven
Fragmented services

Perioperative patient outcome
Facilitating change: the South Tees experience
Are patients engaged?

Doctor: The best thing you can do is give up smoking, drinking and fried food.

Patient: What's the second best?
Methods

Questionnaire-based evaluation of patient motivation and confidence (using a 100mm VAS) to:

- Change single behaviours in the **short vs. longer-term**
- Change **multiple** behaviours **simultaneously** in short vs. longer-term

- Sample size = 300
- Questionnaire delivered in PAC with study investigator
Health Behaviour Research
(n=299)

Demographic information

- 65% male
- 35% female
- 59% married/partner
- 41% single
- 50% South Tees Hospitals
- 50% York Hospitals
- 65 years (range: 21 – 88)

Baseline behavioural risk factors

- 33% do not meet weekly physical activity recommendations
- 2% underweight
- 26% normal weight
- 41% overweight
- 31% obese
- 13% are smokers
- 18% drink alcohol above the recommended weekly limit

- 56% major risk surgery
- 44% minor-moderate risk surgery

Health Behaviour Research
(n=299)
Key Results

Short-term change

Long-term change
Key Results

- **Short-term change**
  - No. unhealthy behaviours: \( x_1 = 87\% \)
    - \( x_2 = 42\% \)
  - Physically **inactive** group: Older and retired
  - Males more likely: Hazardous drinkers
    - Unhealthy BMI
  - Behaviours and IMD: No association

- **Long-term change**
Key Results

- No. unhealthy behaviours: $x_1 = 87\%$
  $x_2 = 42\%$

- Physically inactive group: Older and retired

- Males more likely: Hazardous drinkers
  Unhealthy BMI

- Behaviours and IMD: No association

- Statistically significant preference for short-term change: Single and multiple behaviours

- Preferences: Physical activity $\uparrow$ Alcohol $\downarrow$

- Motivation scores $>>>>>>$ Confidence scores
Key Results

Summary

- Unhealthy behaviours common
- Patients engaged to change preoperatively
- But.......... lack confidence to do so
Key Results

**Summary**

Unhealthy behaviours common

Patients engaged to change preoperatively

But....... lack confidence to do so

Facilitated support/services required to enable patients to change
Piloting a new model of care

**PREP-WELL** - Preparing for surgery: the community prehabilitation and wellbeing project
Prepare Yourself for Surgery...

THE PREPWELL programme

Our programme is designed to help you to identify your individual risks and to support you to make lifestyle changes. By reducing these risks you are likely to make a better and faster recovery from your operation.

For more information visit our website:
southtees.nhs.uk/prepwell

Or you can ask your GP, surgical team or contact us and register your Interest:

stees.prepwell@nhs.net

01642 850850 ext 52341

Surgery can have a major impact on your body. Your health and wellbeing at the time of your operation is important in reducing the risk of complications and speeds up your recovery. The fitter you are the quicker you go home!

PREPWELL is a programme specifically aimed at improving your health by identifying ways that we can help you prepare for surgery. The programme is supervised and based at The Live Well Centre in Middlesbrough.

The Live Well Centre

A unique project by: Middlesbrough

Funded by

The Health Foundation
Primary Aim
To develop and implement a preoperative, community-based, Health and Wellbeing programme

Secondary Aim
To demonstrate improvements in patient health status and QOL from ENTRY to EXIT following programme completion

Objectives
1. Evaluate effectiveness of cross-sector collaboration for programme delivery
2. Evaluate cost and resource implications of programme delivery
3. Evaluate patient engagement and enjoyment with the programme
4. Evaluate success of ‘Clinical Champion’ referral strategy
4. Provide pilot data for sustainability
Community based

• **Why?**
  - Patient choice
  - Ease of access
  - Logistical secondary care issues

• **Where?**
  - Existing PH community facilities + expertise
  - Home-based options

• **How?**
  - Supervised vs. facilitated
Other key components

• Multi-modal approach
  Unhealthy behaviours
  Undiagnosed co-morbidity

• Health trainer delivered
  Physiotherapy oversight

• Aligned to Cardiac Rehabilitation
1. **Listing for Surgery and Screening**
   - One page screening proforma completed by surgeon OR anaesthetist in clinic (Clinical Champions)
   - Proforma sent to, and reviewed by, PREPWELL project manager
   - Patient contacted and invited for ENTRY assessment

2. **ENTRY Assessment**
   - Patient attends community facility
   - 1-stop F2F evaluation of risk behaviours, health status, and Quality of Life (QOL) by PREPWELL PM
   - Multimodal Prehabilitation intervention package agreed and signed off by clinical staff

3. **Prehabilitation Phase**
   - Twice weekly supervised exercise sessions F2F (Or Home based alternative)
   - Access to LIVE WELL lifestyle behaviour services co-incident with exercise sessions e.g. smoking cessation
   - Standard planned duration 6-8 weeks (tailored to patient and surgical requirements)

4. **EXIT Assessment**
   - Mirrors ENTRY assessment
   - Evaluation of changes in risk behaviour, health status and QOL prior to Surgery

5. **Follow-up**
   - Patient contacted remotely at 3 months after discharge
   - Evaluation of sustained behaviour change and QOL
   - Postoperative outcome data collected

---

**PREPWELL Programme Overview**

**Planned Surgery**
1. **Listing for Surgery and Screening**
   - One page screening proforma completed by surgeon OR anaesthetist in clinic (Clinical Champions)
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**PREPWELL Programme Overview**

**Planned Surgery**

5. **Follow-up**
   - Patient contacted remotely at 3 months after discharge
   - Evaluation of sustained behaviour change and QOL
   - Postoperative outcome data collected
**Smoking:**
Poor wound healing and increased risk of complications

**Physical inactivity:**
Low fitness leads to slow recovery and increased risk of complications

**Alcohol consumption:**
> 14 units/Week
Increased risk of complications and longer hospital stay

**Cognitive impairment:**
Strongest predictor of post-operative delirium

**Anaemia:**
Haemoglobin < 130g/L
Increased risk of complications and longer hospital stay

**Malnutrition:**
Both ‘over’ and ‘undernutrition’
Undernutrition increases risk of complications 3 - 4 times

**Obstructive sleep apnoea:**
Abnormal breathing at night
Increased risk of postoperative cardiovascular complications

**Anxiety and Depression:**
Increased risk of postoperative pain and delayed recovery
Clinical evaluation

Specific risk factor evaluation

1. Interventions agreed
2. Action requests for Primary/secondary care
3. Other identified issues

Screening tools

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Status (+ Fagerstrom)</td>
<td></td>
</tr>
<tr>
<td>Alcohol Units/Wk (+ Audit C)</td>
<td></td>
</tr>
<tr>
<td>Activity/exercise</td>
<td>WHO compliance</td>
</tr>
<tr>
<td></td>
<td>6 MWT</td>
</tr>
<tr>
<td>Anxiety + depression</td>
<td>HADS</td>
</tr>
<tr>
<td>Nutrition</td>
<td>BMI and MUST</td>
</tr>
<tr>
<td>OSA</td>
<td>STOPBANG</td>
</tr>
<tr>
<td>Frailty</td>
<td>CFS ➔ EFS</td>
</tr>
<tr>
<td>AF</td>
<td>AliveCor</td>
</tr>
<tr>
<td>Anaemia</td>
<td>Recent blood review</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Recent blood review</td>
</tr>
<tr>
<td>Risk PPC</td>
<td>ARISCAT</td>
</tr>
</tbody>
</table>
Available interventions

**Activity**
- Structured exercise programme
- Home based versus supervised

**Smoking**
- Smoking cessation programme (GSP)
- Livewell service versus PM delivered

**Alcohol**
- PM intervention and advice
- Livewell alcohol service if Audit-C ‘high-risk’

**Anaemia**
- Request early Hb Check if not done
- Request anaemia investigation and management

**Nutrition**
- PM intervention and advice
- Industry support – nutritional products

**Frailty**
- Structured exercise
- Sign-posting to referring clinicians/GP

**OSA**
- Expedited sleep diagnostics
- Industry support
Results
Referred to PREPWELL (n = 159)

Accepted PREPWELL and completed ENTRY assessment (n = 75)

Participated in main (face-to-face) PREPWELL programme (n = 54)

Declined PREPWELL (n = 84)

Opted for home-based programme (n = 21)

• Source of referral
  Surgeons 60%
  Anaesthetists 32%

• Specialty
  Vascular 43%
  Orthopaedics 37%
  Upper GI 11%
  Urology 7%
  Colorectal 2%

Patient characteristics

M:F 70:30
Mean age 69 yrs

Referrals and Specialty
<table>
<thead>
<tr>
<th>Reason</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not interested</td>
<td>30</td>
</tr>
<tr>
<td>Travel/transport</td>
<td>16</td>
</tr>
<tr>
<td>Surgery in &lt;4 weeks</td>
<td>9</td>
</tr>
<tr>
<td>Did not attend</td>
<td>7</td>
</tr>
<tr>
<td>Not medically suitable</td>
<td>7</td>
</tr>
<tr>
<td>Awaiting evaluation</td>
<td>6</td>
</tr>
<tr>
<td>No longer having surgery</td>
<td>6</td>
</tr>
<tr>
<td>Too many appointments</td>
<td>1</td>
</tr>
<tr>
<td>Work commitments</td>
<td>1</td>
</tr>
<tr>
<td>No risk factors to address</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: 84
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- **Specialty**
  - Vascular 43%
  - Orthopaedics 37%
  - Upper GI 11%
  - Urology 7%
  - Colorectal 2%
Analyses are based on data from participants who completed all assessments at ENTRY, EXIT and 3 MONTHS POST-SURGERY (3MPS).

<table>
<thead>
<tr>
<th></th>
<th>ENTRY</th>
<th>EXIT</th>
<th>3MPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients complying with WHO aerobic exercise guidance (%)</td>
<td>17</td>
<td>75</td>
<td>63</td>
</tr>
<tr>
<td>Patients complying with WHO aerobic + strength training guidance (%)</td>
<td>0</td>
<td>73</td>
<td>29</td>
</tr>
<tr>
<td>Mean 6MWD (m)</td>
<td>444</td>
<td>479</td>
<td>N/A</td>
</tr>
<tr>
<td>Alcohol &gt;14 u/week (%)</td>
<td>17</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Smoking (%)</td>
<td>17</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Anxiety Score (mean) *</td>
<td>5.5</td>
<td>5.4</td>
<td>4.4</td>
</tr>
<tr>
<td>Depression Score (mean) **</td>
<td>4.6</td>
<td>3.8</td>
<td>2.5</td>
</tr>
<tr>
<td>HRQOL (mean) ***</td>
<td>0.54</td>
<td>0.64</td>
<td>0.78</td>
</tr>
</tbody>
</table>

* Taken from Hospital Anxiety and Depression Scale (HADS). A higher score equates to greater levels of anxiety (range 0-21).
** Taken from HADS. A higher score equates to greater levels of depression (range 0-21).
*** Taken from EQ5D-3L tool. Score of 1.0 = full health, 0 = a state equivalent to being dead (see Section 10)

WHO = World Health Organisation. WHO guidance = 150 min of moderate exercise and x2 sessions of strength training per week
6MWD = distance walked in 6 minutes, objective measure of aerobic fitness
Health Economics

- Mean cost per patient = £404.86
  Varied by specialty
  Main determinant duration

- Mean cost per patient/week = £52.35

- Costs incorporated:
  Staff
  Equipment
  Facility
Unanticipated benefits!

• Referrals from unexpected sources e.g. AAA screening programme

• Project endorsement by initially ‘skeptical’ surgeons

• Enabler for patients ‘too high risk’ to have successful surgery
Prehabilitation in patients ‘unfit’ for Abdominal Aortic Aneurysm Repair

Sarah Taylor*, Esther Carr*, Gerard Danjoux*

*Newcastle University, †James Cook University Hospital

Introduction

- Prehabilitation aims to increase an individuals’ preoperative fitness to improve surgical outcomes
- When patients are declined surgery due to excessive predicted risk, prehabilitation may provide a gateway to intervention
- We describe 2 patients with Abdominal Aortic Aneurysm (AAA) disease who were deemed ‘unfit’ at multidisciplinary evaluation
- Both patients were prehabilitated through our recently implemented community service: PREPWELL

Methods

- 6 week home-based exercise programme, Inspiratory muscle training + smoking cessation
- Supervised community sessions over 11 weeks

Results

Table 1: Summary table of each patient's initial and repeat (following prehabilitation) CPET results

<table>
<thead>
<tr>
<th></th>
<th>Patient 1</th>
<th>Patient 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPET</td>
<td>Initial (Repeat)</td>
<td>Initial (Repeat)</td>
</tr>
<tr>
<td>Peak Oxygen Consumption (predicted) ml/kg/min</td>
<td>12.3 (20.4)</td>
<td>16.5 (20.4)</td>
</tr>
<tr>
<td>Anaerobic Threshold (predicted) ml/kg/min</td>
<td>7.0 (10.2)</td>
<td>9.2 (10.2)</td>
</tr>
<tr>
<td>% change</td>
<td>34.2 ↑</td>
<td>1.8 ↓</td>
</tr>
</tbody>
</table>

- Stopped smoking and improved fitness
- MDT review and open aneurysm repair
- 8 day hospital stay with no perioperative complications
- Improved fitness
- MDT review and endovascular repair
- 2 day hospital stay with no perioperative complications

Conclusion

- These cases highlight the potential for prehabilitation to expand treatment options for ‘unfit’ patients
- Initiatives such as PREPWELL can facilitate important additional choices for patients and perioperative teams in shared decision-making
- In AAA disease this may alleviate the patient burden of living with a life-threatening condition
- Supervised and home-based interventions may be successful with appropriate patient engagement

References

Patient-reported outcomes

1. Semi-thematic interviews – 1:1
2. EXIT questionnaires
3. Audiovisual recording (consent)
Patient-reported outcomes

1. Semi-thematic interviews – 1:1
2. EXIT questionnaires
3. Audiovisual recording (consent)
I was a bit down in myself and needed to get out to be fit to cope with the stress of having an operation. Why did you choose to take part in the programme? To help with my recovery.
I’ve lost 4 pounds … I seem to be walking the dog a lot further than I used to … my breathing seems a lot better

I’m 100% better … I’ve got my confidence to go out … it’s got me going again … I’m more calm about going in to hospital tomorrow

It changed my attitude

What changes have you noticed as a result of the programme?
Hopefully I’ll get back into golf again.

I would consider going to a gym that was structured in the way this one was.

I’ll get back into it again after the operation.

Has it affected how you will approach life going forwards?
Patient-reported outcomes

1. Semi-thematic interviews – 1:1

2. EXIT questionnaires

3. Audiovisual recording (consent)
In summary

• Implementation was feasible with effective cross-sector working

• Very good patient engagement and feedback

• Improvements in patient health status indicators and HRQOL with evidence of sustained lifestyle improvements

• ‘Clinical Champion’ programme worked effectively

• Learn lessons and move forwards.......
Development Aims

- Integrate learning from pilot phase
- Meet differing patient risk and prehabilitation requirements
- Widen access targeting ‘prehabilitation for all’
- Make optimal use of regional facilities, staff and resources to deliver prehabilitation
- Facilitate rapid service monitoring, audit and research integrating a digital patient database and live ‘dashboard’
- Develop a competency framework for staff delivering prehabilitation

PREPWELL High-risk pathway

- Evolution of pilot model
- Higher-risk patients requiring more intensive and closely monitored intervention
- Two-year focus on developing pathways for patients undergoing surgery with vascular disease (e.g. AAA) and people requiring intervention for cancer
- Development of supervised lifestyle offer across several community locations in South Tees
- Implementation of a skills and competencies framework for health trainers and staff to deliver face to face prehabilitation

PREPWELL Low-risk pathway

- Development of new ‘high-volume’ pathway
- Lower-risk patients typically undergoing major orthopaedic surgery requiring less intensive and less ‘medicalised’ preoperative support
- Dedicated project manager newly appointed
- Planned to embed in multiple existing regional public health exercise facilities
- Implementation of a skills and competencies framework for health trainers and staff to deliver face to face prehabilitation

Digital PREPWELL Home-based pathway

- Development of digital platform for patients unable to engage with face-to-face options
- Facilitated self-managed option
- Potentially more cost-effective
- Aligns with NHS priorities to deliver digital healthcare and telemedicine
- Can supplement low and high-risk pathways
- In development in collaboration with:
Patient stories

https://vimeo.com/323713515/e15ad54740
Acknowledgements

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