Practical issues and current concerns –
getting (and keeping) patients home on HPN

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Overview

- Consider some of the challenges when discharging someone home on parenteral nutrition
- Present some emerging strategies aimed at enhancing monitoring and avoiding long term complications associated with parenteral nutrition, thereby keeping patients at home
The journey home

- Homecare package
- Establishing HPN regimen
- Who will care for CVC

2-6 weeks
Can service be provided from the Framework? Is the home suitable for HPN? What other services are needed?

Can fluid/nutrient needs be met? How often will pt feed? When and where will patient feed?

Who will care for CVC? Appropriate CVC? Can nursing be provided from Framework? Is exit site position amenable to self care?
Environment

- What is an appropriate home environment?
- National Framework assessment
  - 75 questions
  - Electricity
  - Running water
- Where are procedures going to take place
- Where will equipment be stored
- Where would *you* store the equipment & undertake the procedures
Ancillaries

- Standard ancillary list
  - Items selected based on current evidence & best practice guidelines

- The decision to use a specific product remains the responsibility of the individual HPN centre
  - Not restricted to what is used in hospital
  - Only items on the framework list will be reimbursed by NHS England
  - Other items can be requested but will need to be paid for by the discharging hospital
Pump

- Ambulatory pumps associated with increase in QOL (Saqui et al 2014)
- Which pump?
  - Pumps need to have been reviewed by LITRE & appear on HPN Framework
  - Implications for homecare of selecting new pump
- How much choice do patients have?
  - How many pumps?
    - £4000 per year
- Don’t forget the rucksack
Managing expectations

- Company
  - What is provided by company & what isn’t
  - Delivery times & extra deliveries
  - Travel

- Nursing
  - Nursing visits within 2 hour window
  - 48 hour notice required to restart

- Hospital
  - Readmission
  - Surgery date

Reducing complications

- All patients should have access to a multidisciplinary nutrition support team
- Protocols for line insertion and aftercare
- Formal teaching programme
- Ongoing support once discharged

Staun et al (2009)
CVC care guidelines

- Are equipment and procedures suitable for home environment?
  - Most guidelines focus on inpatient care
  - Does “one size really fit all?”

- Procedures should be
  - Evidence based
  - Standardised
  - Individualised
  - Simple to follow
  - Consider lifestyle

- Patient/carer knowledge and compliance should be monitored
Formal training

Implications of non-compliance can be life threatening

Manual dexterity, strength and visual acuity needed

Learning achieved through repeated supervised practice
How long does it take?

About 20 hours
# What needs to be learnt?

<table>
<thead>
<tr>
<th>Catheter care</th>
<th>Principles of asepsis</th>
<th>Handwashing</th>
<th>Putting on gloves</th>
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<tbody>
<tr>
<td>Dehydration</td>
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<td>Overload</td>
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<td>Fracture</td>
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<td>Occlusion</td>
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<td>Local infection</td>
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<td>Systemic infection</td>
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<td>Troubleshooting</td>
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<tr>
<th>St Marks Hospital, NWLH Trust</th>
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<tbody>
<tr>
<td><strong>Home Parenteral Nutrition Training Programme</strong></td>
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<th>Training Ladder</th>
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<td><strong>Name:</strong></td>
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<td><strong>Notes:</strong></td>
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<th>Testimonial</th>
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<th>Date training completed</th>
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<th>Print Name</th>
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<th>Infusion rates</th>
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<th>Care of PN</th>
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<table>
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<th>Stock rotation</th>
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<th>Hub disinfection</th>
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<th>Connector change</th>
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<th>Dressing change</th>
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<tr>
<th>Infusion rates</th>
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Problem solving

- Correct & prompt identification of problems vital

- Knowledge quiz surrounding 7 complications
  - Systemic & local infection, occlusion, fracture, thrombosis, fluid overload & dehydration

- 70 patients
  - Mean 58 (1-337) months
  - Median score 72% (24-96%)
  - No correlation between score and number of complications, r=0.016, p=0.9

Hanson et al (2011) Abstract
Ongoing assessment

- 12 patients assessed annually for 3 yrs
  - Median time on HPN 7 (4-22) years
- High assessment scores not always associated with correct identification of problem
  - Only 6 (50%) pts correctly identified problems
    - Local infection & occlusion
- CRBSI missed by 4 (33%) patients
  - Even on subsequent presentations
  - Classic presenting signs

Small & Gabe (2013) Abstract
While it may seem obvious....

- “I haven’t been shown how to put up Saline”
- You only need 1 needlefree connector
  - 1 per lumen
  - Don’t suck on it
- If the catheter hub comes off, don’t reinsert it
- If your catheter fractures don’t mend it with superglue
  - Especially if you’re about to fly
- If your catheter falls out.....
  - Don’t put it back in!
Ongoing support

- Complications common following initial discharge
- \( \frac{1}{3} \) new HPN patients had a complication within 90 days of initial discharge Burgoa et al (2006)
- Robust support network required
- Who to contact if problems occur & how
Monitoring compliance

- Re-evaluation by direct observation & semi-structured interviews
  - 19 areas of adherence

- 21 patients mean 49 (18-68) years, median time on HPN 4 (1-8) years
  - At least 1 area of non-adherence was identified in all patients, mean 5 (1-11)
  - 16(75%) not always flushed their catheter promptly at the end of an infusion

- No correlation between number of CRBSI and areas of non adherence
  \( r=0.27, p=0.1 \)

Making changes

- Patient initiated
  - How flexible are we?
- Health care team initiated
  - How necessary?
    - All patients?
- Takes time
  - 1:1 demonstration
  - Written information
    - Follow up
- Expect resistance to change
  - Don’t assume changes will be understood or welcomed...
An example

- Introduction of 70% isopropyl port protector (Curos®)
  - Took 10 months to demonstrate to all patients (n=285)

- 2 patients declined
  - 1 does not use needlefree connectors
    - 26 yrs on HPN, 1 CRBSI
  - 1 “couldn’t see the point”
    - 14 yrs on HPN, 0 CRBSI

- 5 patients made follow up calls to the helpline for advice on how to use after demonstration & info sheet
Lifestyle considerations
All of the above have been directly associated with catheter fracture
## Local experience

<table>
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<tr>
<th>Lifestyle factor</th>
<th>Correct response</th>
<th>% compliant n(%)</th>
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<tbody>
<tr>
<td>Long fingernails?</td>
<td>no</td>
<td>20 (95%)</td>
</tr>
<tr>
<td>Artificial nails?</td>
<td>no</td>
<td>20 (95%)</td>
</tr>
<tr>
<td>Nail polish?</td>
<td>no</td>
<td>19 (90%)</td>
</tr>
<tr>
<td>Rings?</td>
<td>no</td>
<td>8 (38%)</td>
</tr>
<tr>
<td>Remove rings for handwashing?</td>
<td>yes</td>
<td>6 (29%)</td>
</tr>
<tr>
<td>Swim regularly?</td>
<td>no</td>
<td>18 (86%)</td>
</tr>
<tr>
<td>Procedures undertaken under influence of alcohol?</td>
<td>no</td>
<td>17 (81%)</td>
</tr>
<tr>
<td>Pets with access to where procedures undertaken?</td>
<td>no</td>
<td>18 (86%)</td>
</tr>
<tr>
<td>Ongoing dental problems?</td>
<td>no</td>
<td>14 (67%)</td>
</tr>
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n=21

Small & Gabe (2013) Abstract
Where next?

- Harnessing technology to improve patient experience & outcomes
- Innovative pump technology to monitor infusions & detect catheter related complications\(^1\)

\(^1\)Small et al (2015) ESPEN Abstract
Micrelcare™

“Remote control for home infusion therapies”

External battery pack incorporating GPRS technology

Secure Micrelcare™ server

Infusion pressure

Email alerts

Infusion histories

www.micrelmed.com
Pump infusion pressures

1 patient with clinically confirmed thrombosis had a pressure spike of 0.67 bar 5 days before presenting with symptoms

Pressures in preceding 6 months within normal limits ≤ 0.58 bar
Email alerts

Pump alarms generate a real time email outlining type of alarm

Patient has valved port, very deep set, finding it difficult to insert gripper
Infusion histories

Prescribed volume vs actual infused
\[ r = 0.81 \]
Mean \(77 \pm 32\) (23-141) %
<table>
<thead>
<tr>
<th></th>
<th>Patient A</th>
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<th>Patient B</th>
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<th>Patient C</th>
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<tbody>
<tr>
<td>Px</td>
<td>3000 mL</td>
<td>Actual infused</td>
<td>2250 mL</td>
<td>Actual infused</td>
<td>1000 mL</td>
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<tr>
<td>Volume</td>
<td>2400 mL</td>
<td></td>
<td>1000 mL</td>
<td></td>
<td>500 mL</td>
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<tr>
<td>% each infusion</td>
<td>80%</td>
<td></td>
<td>44%</td>
<td></td>
<td>50%</td>
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<tr>
<td>Nitrogen</td>
<td>0</td>
<td></td>
<td>9</td>
<td></td>
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<td>Kcal</td>
<td>0</td>
<td></td>
<td>1200</td>
<td></td>
<td>400</td>
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<tr>
<td>Sodium</td>
<td>250</td>
<td></td>
<td>82.5</td>
<td></td>
<td>50</td>
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<tr>
<td>Potassium</td>
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Thank you, any questions