Attempts at setting up an in house elastomeric device service for OPAT

Dr Sue Snape
Consultant in Microbiology and Infectious Diseases
• Issues with elastomeric device delivery of antibiotics:
  ◦ Lack of published stability data
    • BSAC initiative – No published peer-reviewed studies available fully compliant with UK national standards for stability testing (Jenkins et al JAC 2017 v72 (4) p1217-1220)
    • Yellow covered document – 37°C stability
2012

- Issues with in-house delivery:
  - Space – penicillins are an issue (MHRA) therefore NO
  - Time – if you can buy in form elsewhere then do

- Help from industry
  - Commissioned own stability testing
  - Provided precompounded antibiotics via either prefilled syringes or elastomeric devices for intermittent use
2012-2016

- Part of the East Midlands consortium:
  - Contract with private provider to deliver:
    - Precompounded Antibiotics:
      - via either syringes or elastomeric devices for a huge range of antibiotics
      - Delivery of the antibiotics to the patient’s home
      - Suitable storage devices for the antibiotics – ie fridges
      - Suitable waste disposal
    - Healthcare worker delivered antibiotics
Reflections

Overall:
- Abx side of things good – with good TAT – order by 3 and get the abx next day – inc on a Friday! – No orders accepted on Sat and Sun
- HCW delivered – excellent nurses

What’s not to love?
- Price hike at 11th hour and 59th minute despite promising no change in contract at a FTF meeting 2 weeks before
- No 24hr infusions available
- Woeful scheduling of HCW delivered service
By January 2017 what was available in Nottingham?

• What do we provide?
  • Patient/carer self administration of antibiotics either from powder or prefilled
  • Daily visits to the IV infusion centre
  • HCW delivered abx for housebound patients upto TDS – 4 TDS slots available; geography is an issue

• Why do we need 24hr infusions of antibiotics?
  • TDS HCW abx delivery is costly for commissioners and time consuming for staff
  • QDS patient delivered abx are exhausting for patients – untenable
  • Stewardship
Exciting developments

- **Yellow covered document** — 37°C stability — now changed to 32°C for body-worn infusions

- **BSAC initiative** — 2 studies performed detailing stability of continuous infusions of flucloxacillin (Allwood et al Eur J Hosp Pharm 2018; 0:1-5) with meropenem in the pipeline (poster OPAT conference 2017)

- **This information is open access**

- **Industry buy in** — buffered flucloxacillin, benzylpenicillin, piperacillin/tazobactam from device manufacturers but the stability data is not necessarily available to all
So what did we do?

Current provider of pre-compounded antibiotics not able to provide the antibiotics as 24hr infusions so sought another private provider

- Issues with time to delivery
  - Mon pre 12 – Wed delivery
  - Tues pre 12 – Thurs delivery
  - Wed pre 12 – Fri deliver
  - Wed 12.01 – Mon delivery
  - Thurs 12.01 – Tues delivery
  - Fri 12.01 – Wed delivery
- If you want the drugs earlier that comes with an EXTRA delivery charge PLUS an EXTRA CHARGE PER DEVICE
- Issues with interrupted service
- Issues with closure over Christmas
In house possibilities - PILOT

Change of management in pharmacy

• Pilot in house production of elastomeric device delivered 24hr infusions of flucloxacillin and piperacillin/tazobactam using data available from a device manufacturer and assurances from Mark Santilo

• Incredibly accommodating CYTOLAB team – weekday cut off time 3pm for next day availability (– with a flex to 5pm in a crisis 😊)
<table>
<thead>
<tr>
<th>Provider</th>
<th>Days service available</th>
<th>Patient episodes</th>
<th>Average Patient episodes/ yr</th>
<th>Bed days saved</th>
<th>Beds /yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>286</td>
<td>23</td>
<td>29.3</td>
<td>305</td>
<td>1.06</td>
</tr>
<tr>
<td>In-house</td>
<td>85</td>
<td>15</td>
<td>64.4</td>
<td>246</td>
<td>2.89</td>
</tr>
<tr>
<td>Private</td>
<td>146</td>
<td>13</td>
<td>32.5</td>
<td>212</td>
<td>1.45</td>
</tr>
</tbody>
</table>

**Total bed days saved**

![Average bed days saved](chart.png)

Days since start of 24 hour infusions

```
Provider          Days service available | Patient episodes | Average Patient episodes/ yr | Bed days saved | Beds /yr |
------------------|-------------------|-----------------------------|----------------|----------|
Private           | 286               | 23                          | 29.3           | 305      | 1.06     |
In-house          | 85                | 15                          | 64.4           | 246      | 2.89     |
Private           | 146               | 13                          | 32.5           | 212      | 1.45     |

Total bed days saved
```
The business case

- The OPAT numbers speak for themselves
  - The ‘do nothing option’:
    - 436 BDS/yr (1.19 beds/yr)
  - In house manufacture:
    - 1054 BDS/yr (2.89 beds/yr)

- But – what about the finances ££

Savings of cost of devices/antibiotics and compounding + Delivery fees of private provider

VS

NUH cost of devices/antibiotics + Compounding
ie 2x Band 3 posts
<table>
<thead>
<tr>
<th>Description</th>
<th>2019/20 (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in Abx/ devices + compounding costs from commercial aseptic compounding units</td>
<td>(102,407)</td>
</tr>
<tr>
<td>Reduction in delivery costs preparing OPAT infusors in-house</td>
<td>(9,360)</td>
</tr>
<tr>
<td>Increase in non-pay costs (cost of infusors, consumables and drugs) associated preparing OPAT infusors in-house</td>
<td>59,401</td>
</tr>
<tr>
<td>Increase in pay costs (2 x 1.0 Band 3 Staff Members) preparing OPAT infusors in-house</td>
<td>46,983</td>
</tr>
<tr>
<td>Net Increase / (Decrease) in Operating Costs</td>
<td>(5,383)</td>
</tr>
</tbody>
</table>
Where are we upto?

- Business case written, submitted and presented
- Approval or rejection decided upon TOMORROW!
The future?

- What’s not possible – meropenem, ceftazidime and amoxicillin 😞
- What is possible - Voumard et al 2018– flucloxacillin, cefepime, vancomycin, piperacillin/tazobactam – safe and efficacious in patients but no drug stability data in the paper
- Threats to precompounded services
  - Cost effectiveness for private providers or in house production units
Many thanks to:
CYTOLAB team – Erica Lieberman
Pharmacy at NUH – James Walker and Tim Hills
OPAT nurses – Amanda Bort and the team
OPAT doctors
OPAT business manager
Any questions?