

The background of the slide features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

# Elastomeric Pilot in Southern Health and Social Care Trust

Peter McKee - Lead OPAT Pharmacist

# Background

## ► Southern Trust OPAT service

- Currently 8 am - 6 pm Monday - Friday
- IV Nurse specialists, Consultant Microbiologists, Antimicrobial pharmacists
- Review and clinical plan prior to discharge and counselling
- Trouble shooting
- Weekly multidisciplinary team meetings
- OPAT patients largely once daily administration
- Fortnightly patient review clinics
  - Clinical review
  - Medication supply
  - Line/administration issues
  - Stewardship

# Background - elastomerics

- ▶ 24-hour infusor devices for antibiotics
- ▶ Elastomeric pumps that deliver medication slowly and continuously over a 24-hour period
- ▶ Utilise flexible balloon inside a soft-shell container to hold the antibiotic solution
- ▶ Balloon's pressure forces the medication out through a flow restrictor
- ▶ Ensuring a consistent and controlled infusion rate
- ▶ Benefits
  - ▶ More options for OPAT
  - ▶ Stewardship

# Background - models considered

- ▶ Aseptic unit production
- ▶ Ready made devices
- ▶ Fresh self-filled
  - ▶ OPAT Team
  - ▶ District Nursing



# Background - model chosen

- ▶ Fresh self filled - BBraun

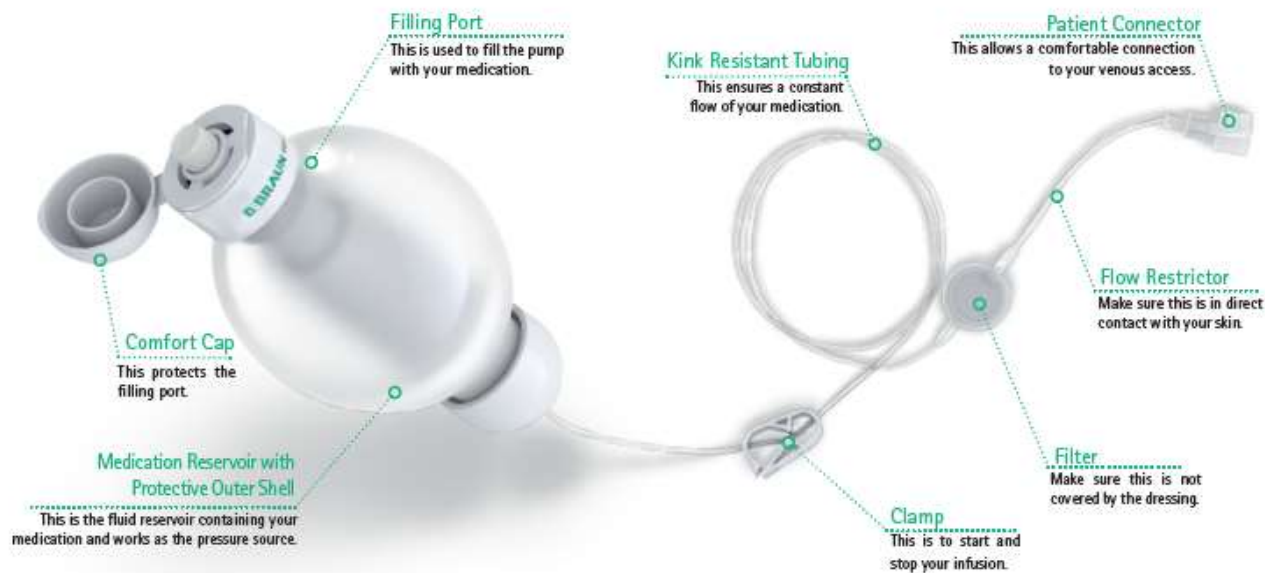
- ▶ OPAT Team
- ▶ Bbraun site visits
- ▶ Policy
  - ▶ Governance
  - ▶ D&T

- ▶ Pilot

- ▶ In-patients
- ▶ Bed retained in hospital
- ▶ Ward teams trained

# Background - model chosen

- Fresh self filled
  - BBraun
  - Up to 240 mL
  - Antibiotics reconstituted and added back to Sodium Chloride 0.9% bag
  - Attached to elastomeric via 3 way tap and hand filler



# Stability - flucloxacillin

Stability Data Sheet: Flucloxacillin			Ref No.: SM_ST003 v2	<b>B   BRAUN</b>	
Type:	Form	Version: 1	Page:	1 of 2	
Approved Date:		28/03/2025	Effective Date:	28/03/2025	Review Date: 28/03/2027

**Drug Name: Flucloxacillin**

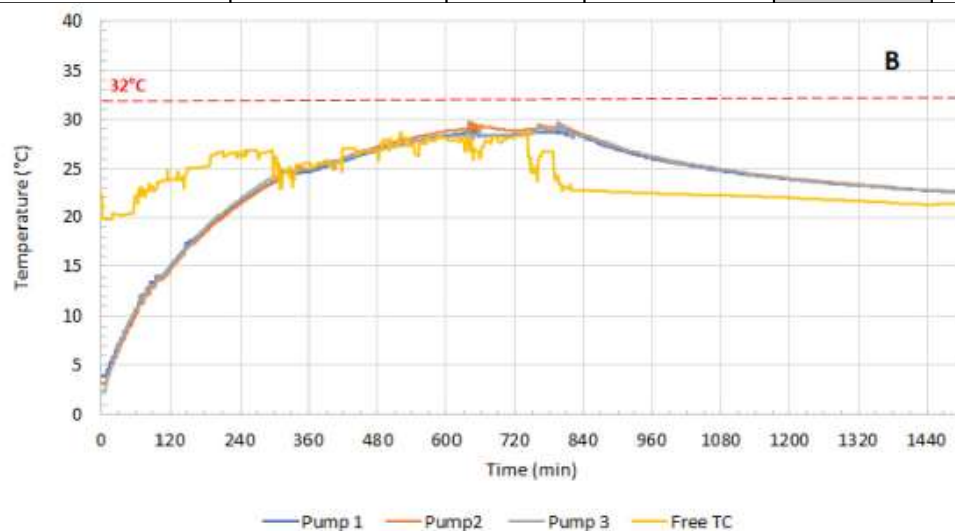
Device/Container	Drug Concentration Range (mg/ml)	Diluent	Shelf Life			Combined (yes/no)	UK Study Reference
			2-8 °C (days)	15-25 °C (days)	32 °C (hours)		
Easypump® II	16.7 - 50	Sodium chloride 0.9%			24	No	08

# Stability - Piperacillin / Tazobactam

Stability Data Sheet: Piperacillin Tazobactam			Ref No.: SM_ST002 v1	<b>B   BRAUN</b>	
Type:	Form	Version: 1		Page:	1 of 1
Approved Date:	04/12/2024	Effective Date:	04/12/2024	Review Date:	04/12/2026

## Drug Name: Piperacillin Tazobactam

Device/Container	Drug Concentration Range (mg/ml)	Diluent	Shelf Life			Combined (yes/no)	UK Study Reference
			2-8 °C (days)	15-25 °C (days)	32 °C (hours)		
Easypump® II	10 - 80	Sodium chloride 0.9%	28	1		No	08



**Figure 1** Diluent temperature within the soft shell elastomeric pump measured over a period of 25 hours during the summer (n=3). (A) Pumps filled to half volume with diluent; (B) Pumps filled to full volume with diluent. The free thermocouple measured ambient temperature outside of the pumps. The red line indicates the threshold that should not be exceeded for stability studies to be conducted at 32°C.



# Patient 1

- ▶ 79 year old female
- ▶ Presented
  - ▶ rigors, non productive cough, urinary frequency
- ▶ Blood culture = *Staphylococcus aureus* (MSSA)
- ▶ Spinal MRI - discitis
- ▶ Plan
  - ▶ Flucloxacillin 2g IV QID
  - ▶ 6 weeks
  - ▶ Not MFFD
- ▶ Received flucloxacillin 8g elastomeric for 14 days
  - ▶ Ward staff trained
  - ▶ One day 10-15 mL residual
  - ▶ No issues
  - ▶ Positive feedback

# Patient 2

- ▶ 76 male
- ▶ History
  - ▶ Type A aortic dissection repair + hemi-arch replacement graft May 2022
- ▶ Presentation
  - ▶ Likely abdominal aortic aneurysm (AAA) graft infection
- ▶ Collection surrounding the ascending aorta
- ▶ Endocarditis
- ▶ MSSA bacteraemia
- ▶ Plan
  - ▶ Gentamicin IV 240 mg OD
  - ▶ Flucloxacillin IV 2g 4 hourly
  - ▶ Rifampicin PO 450 mg BD

## Patient 2

- ▶ End of 2 weeks gentamicin eGFR = 48 mL/min. Baseline > 60 mL/min
- ▶ Flucloxacillin 12g elastomeric began day 16 of treatment
- ▶ Continued for 10 days. eGFR = 40 mL/min
- ▶ Prolonged high doses of flucloxacillin can give cause renal impairment
- ▶ Switched to high dose cefazolin 2g TID
- ▶ eGFR recovered to baseline
- ▶ Ward staff trained
- ▶ No issues with residual
- ▶ No issues with elastomeric
- ▶ Positive feedback on device, although disappointed had to switch treatment and stop

# Patient 3

- ▶ 39 year old male farmer
- ▶ Stepped on a thorn from hedgerow - went through his wellingtons on the right foot
- ▶ Small penetrating lesion
- ▶ 7 days oral flucloxacillin - no improvement
- ▶ MRI showed deep seated infection and tenosynovitis
- ▶ Not systemically unwell but had severe pain
- ▶ Potential for inoculation of water associated organisms (often pseudomonas) at the time of penetration associated with the plastic in the wellington boot
- ▶ Empirically started piperacillin/tazobactam 4.5g QID + Gentamicin
- ▶ Aspiration attempt was dry
- ▶ Options considered:
  - ▶ Tazocin 4.5g QID or meropenem 2g TID

## Patient 3

- ▶ Clinically well, 4 children at home (2, 4, 6 & 8)
- ▶ Piperacillin/tazobactam 18 g infusor in 240 mL
  - ▶ Stability data 15 - 25 °C
- ▶ Ward staff trained
- ▶ After 4 days elastomeric exchanged each day and patient went home
- ▶ First 11 days no issues / no residual
- ▶ Day 12 - 16 approximately 20 mL residual
  - ▶ Colder weather
  - ▶ Volume decreased to 220 mL total
    - ▶ Stability data to 80 mg /mL
- ▶ Day 17 - 29
  - ▶ 8 mL residual one day
  - ▶ 10 mL residual one day (stopped one hour early for MRI)
- ▶ Positive feedback



Thank  
you

To  
Pauline, Peter + ALL the CRT team

Thank you very much for all your input + care over the last 6½ weeks. You are a fantastic team who are clearly dedicated to the care you provide to patients. The infusion pump was a great success and we were delighted that it allowed [redacted] to spend time at home. All the best with its continued implementation!

Regards

# Encompass documentation

Elastomeric Easypump 24-Hour infusion for continuous intravenous antibiotic therapy for @PATIENT@		
<ul style="list-style-type: none"> <li>Consent obtained from @PATIENT@</li> <li>Written and verbal information provided re: Elastomeric Easypump infusor</li> <li>Ward staff and consultant agreed to use</li> <li>Allergy status Penicillins ( patient has cough not true allergy)</li> </ul>		
Infusor Details		
Antibiotic:	Flucloxacillin 12g	
Start time over 24 hours:	16:00 hours	
Checklist Completion		
<input checked="" type="checkbox"/>	Close clamp, remove Easypump and flush PICC line with 20mL NaCl 0.9%	
<input checked="" type="checkbox"/>	Record approximately how many mLs remain (residual if any)	0mL
<input checked="" type="checkbox"/>	Check for any adverse effects or concerns in the last 24 hours e.g. temperatures, fevers, rash, itch. Contact medical staff if required.	
<input checked="" type="checkbox"/>	Review daily observations & discuss any concerns with medical staff as appropriate	<b>Visit Vital Signs</b> BP (I) 107/63 Pulse 60 Temp 36.5 °C Resp 18
<input checked="" type="checkbox"/>	Check PICC line dressing - confirmed intact, no leakage noted	<input checked="" type="checkbox"/> Complete PICC line LDA
<input checked="" type="checkbox"/>	Check correct drug dose, diluent and all equipment expiry dates	<input checked="" type="checkbox"/> Complete on MAR
<input checked="" type="checkbox"/>	Obtain venous return from PICC line	If requiring bloods, take sample at this stage prior to attaching new Easypump infusor

<input checked="" type="checkbox"/>	Flush PICC line with 20mL NaCl 0.9%
<input checked="" type="checkbox"/>	Attach new Easypump infusor to PICC line, ensuring air inlet facing out with arrow pointing upwards and secure with dressing
<input checked="" type="checkbox"/>	Final check <b>ALWAYS</b> ensure Easypump clamp is open
<b>Antibiotic Elastomeric Easypump 24-Hour infusor commenced as prescribed on MAR.</b>	
If Easypump infusor does not seem to be emptying, please check that: <ul style="list-style-type: none"> <li>The pump is at room temperature</li> <li>The white clamp on the tube is open</li> <li>There are no kinks in the Easypump tubing</li> </ul>	
Any concerns, contact IV Co-ordinator/OPAT Team on Mobile 07917391012 between 9am-5pm on Mondays-Friday.	

# Next steps

- ▶ Continue pilot
  - ▶ 2 further patient recently started a flucloxacillin elastomeric
    - ▶ Right THR infection (DAIR) - MSSA
    - ▶ Endocarditis - MSSA
- ▶ Ward involvement
- ▶ Clinic space
- ▶ Weekend service
- ▶ District nurse involvement
- ▶ More antibiotics

Questions?

