

Outpatient Parenteral Antimicrobial Therapy (OPAT) with Continuous Infusions by Elastomeric Infusion Devices in Japan, as an Effective Tool for Better Antimicrobial Stewardship

Ryota Hase, MD, Daisuke Suzuki, MD, Kiyoharu Muranaka, MD, Takahiro Mikawa, MD, Shunsuke Uno, MD, Kazuyasu Miyoshi, MD, Koji Fujita, MD, Hiroyuki Suzuki, MD and Naoto Hosokawa, MD, PhD
Department of Infectious Diseases, Kameda Medical Center, Kamogawa, Chiba, Japan

Contact Information:
Ryota Hase, MD
Department of Infectious Diseases
Kameda Medical Center
929 Higashi-cho, Kamogawa, Chiba,
Japan
Email: ryota510@hotmail.com
Phone: +81-4-7092-2211



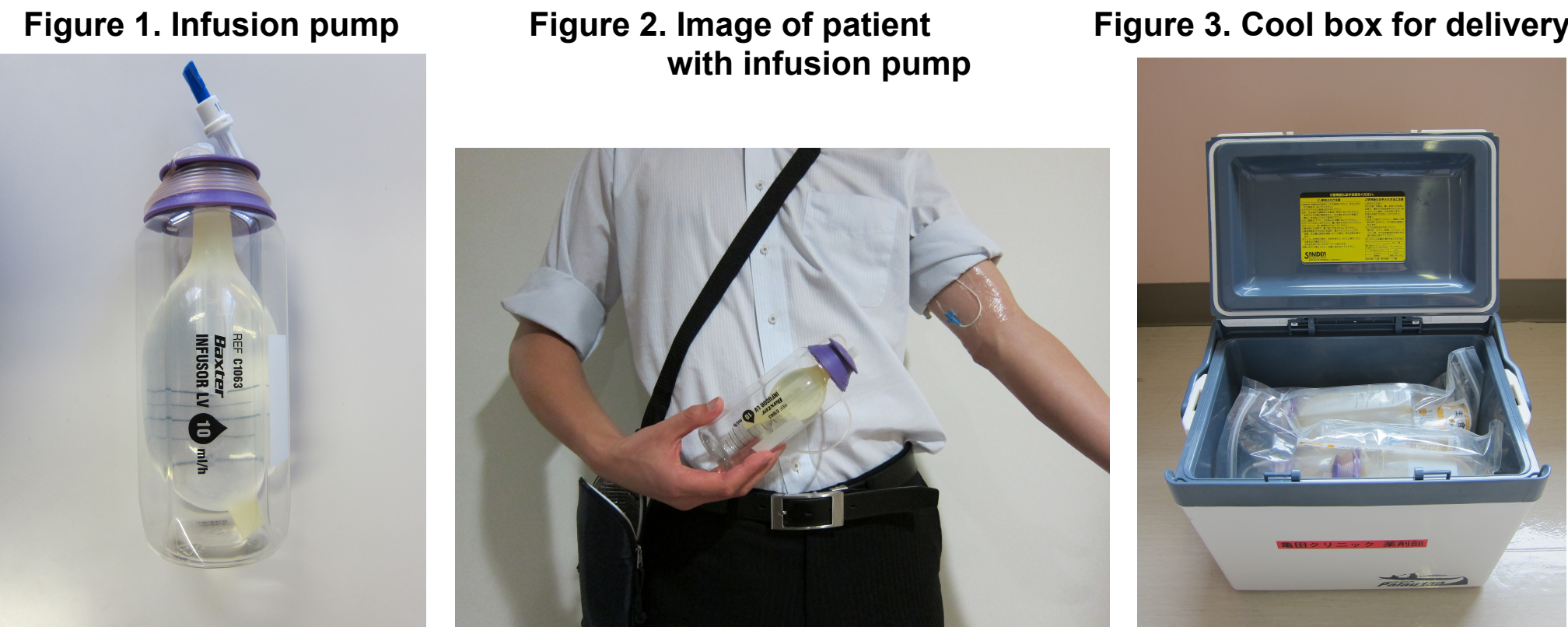
Abstract

Background: Once-daily antimicrobials such as ceftriaxone are frequently used for OPAT in many countries, however those agents tend to be overused due to their convenience. Our infectious diseases team implemented the new OPAT project with continuous infusion by elastomeric infusion devices in July 2012 and has expanded it with support of homecare services. The aim of this study is to review our project at Kameda Medical Center after 22 months of operation.

Methods: We retrospectively collected data about age, sex, diagnosis, organisms, types of OPAT (hospital OPAT or homecare OPAT), antimicrobials, treatment duration, bed-days saved, outcome, readmission rate and estimated cost reductions of all patients who were treated by OPAT with continuous infusions from July 2012 till April 2014.

Results: 20 patients were treated by OPAT with continuous infusions by elastomeric infusion devices during the study term. The median age was 62 years (range 15-82). 15 patients (75%) were treated by clinic OPAT, and 5 (25%) treated by homecare OPAT. The most common diagnosis was osteomyelitis, followed by soft tissue infection. The prevalence of bacteremia was 60%. The most commonly targeted organism was methicillin-susceptible *Staphylococcus aureus*. Cefazolin was used most frequently (60%), followed by Penicillin G (15%). The median OPAT days was 15 (range 4-29 days). Total bed days saved was 311. Peripheral inserted central catheter (PICC) was inserted for all patients and only one had to change PICC during the treatment. Only one patient discontinued OPAT due to leukocytopenia. 18 patients were cured and 2 were improved. Only one patient needed readmission within 30 days after completion of therapy. The estimated medical cost reduction was about 2.8 million yen, that is approximately 25 thousand US dollars.

Conclusion: Our OPAT project with continuous infusions by elastomeric infusion devices successfully used first-line narrow spectrum antimicrobials for outpatients, which avoids prescribing unnecessary once-daily antimicrobials with broader spectrum. Our experience shows OPAT with continuous infusion is safe and feasible practice not only for efficient bed utilizations and medical cost savings but also for better antimicrobial stewardship.



Background

- Ceftriaxone is frequently used for outpatients but OPAT services managed by infectious diseases specialist are rare in Japan
- Our infectious diseases team implemented the new OPAT project with continuous infusion by elastomeric infusion devices in July 2012
- The aim of this study is to review our project after 22 months of operation

Methods

- Patients treated by OPAT with continuous infusions from July 2012 to April 2014 were included
- Age, sex, diagnosis, causative organisms, types of OPAT, antimicrobials, treatment duration, completion, bed-days saved, outcome, 30-Day readmission, estimated cost reduction were analyzed
- Outcome were categorized into 3 groups: cure, improved, and failure
- Estimated cost reduction was calculated by subtracting actual cost for OPAT and cost for infusion pumps from estimated cost for inpatient treatment

Result

Factor	Number
Episodes No.	20
Median age in Years (range)	62 (15-82)
Sex (male/female) No.	14/6
Diagnosis No.	
Bone and Joint infections	8
Skin and soft tissue infections	3
Infective endocarditis	2
Central nervous system infections	2
PID	2
CRBSI	1
Intra-abdominal infections	1
Others (primary bacteremia)	1
Bacteremia No. (%)	12 (60.0)
OPAT type No. (%)	
clinic OPAT	15 (75.0)
homecare OPAT	5 (25.0)

PID: Pelvic inflammatory disease, CRBSI: Catheter-related blood stream infection

Figure 4. Selected antimicrobials for OPAT

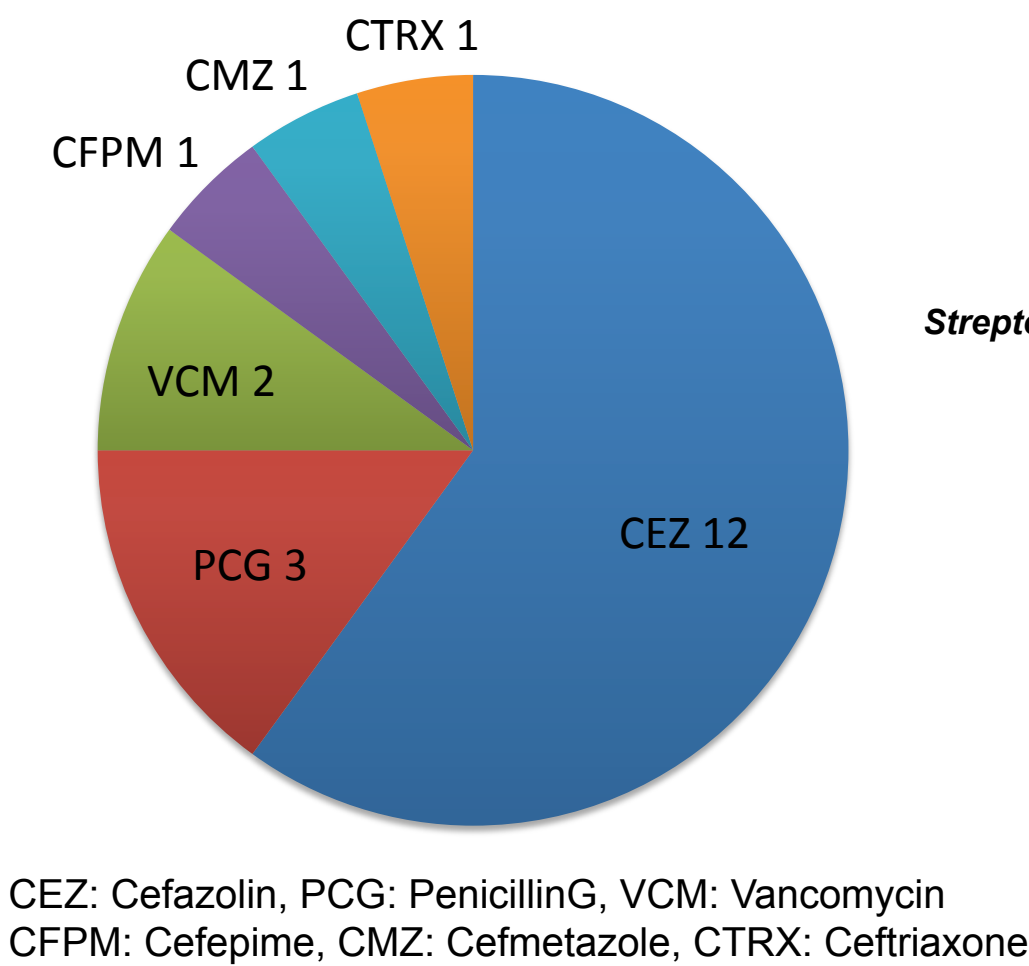
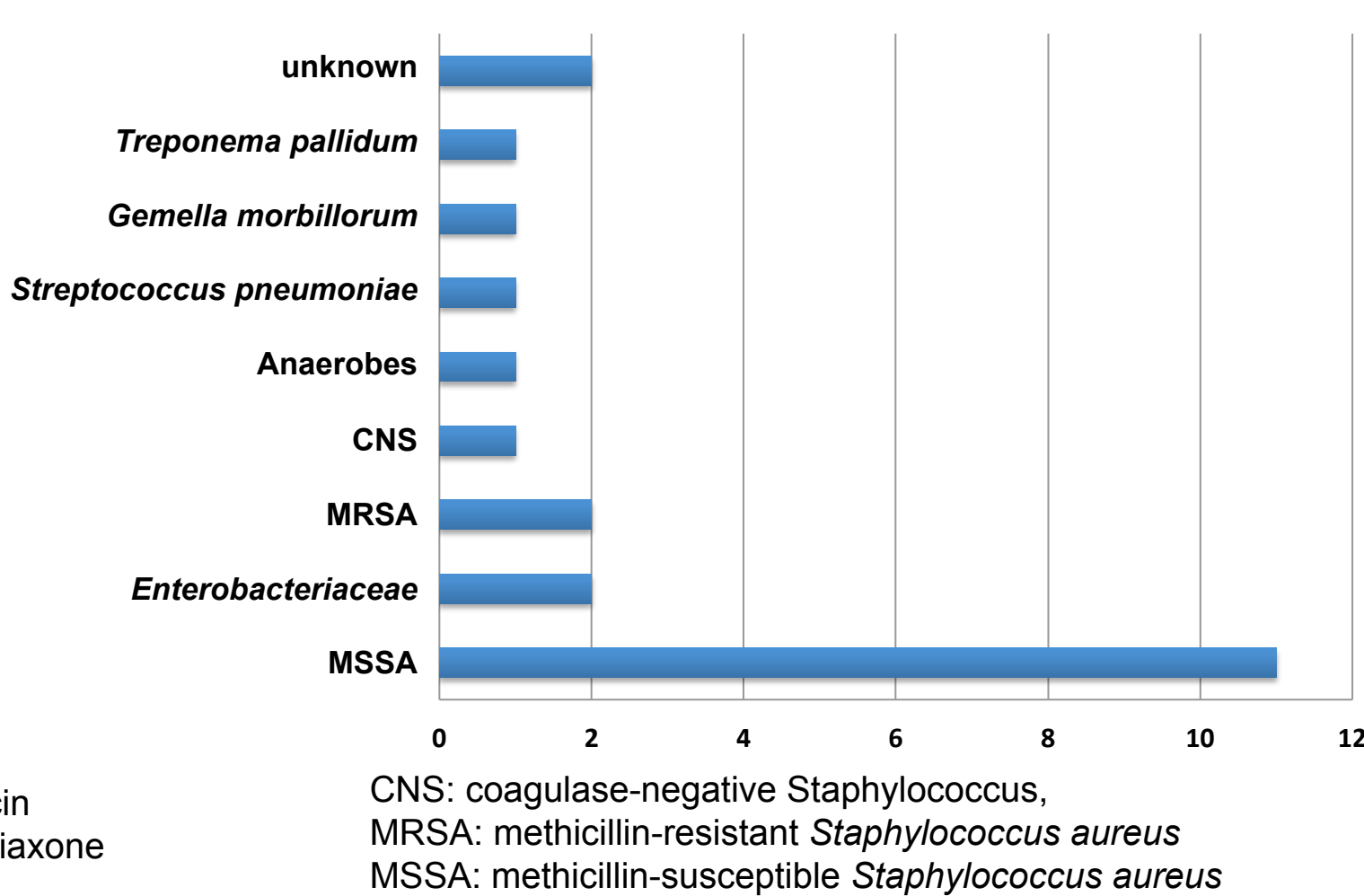


Figure 5. Targeted causative organisms



Factor	Number
Median treatment duration days (range)	15 (4-29)
Total bed days saved	311
Estimated cost reduction (yen/US dollars)	¥2,790,900 / \$25,723
Completion of OPAT No. (%)	
Completed	19 (95)
Discontinued	1 (5)
Outcome No. (%)	
Cure	18 (90)
Improved	2 (10)
Failure	0 (0)
30-Day Readmission No. (%)	1 (5)

Conclusion

- Our OPAT project with continuous infusions by elastomeric infusion devices successfully used first-line narrow spectrum antimicrobials for outpatients, which avoids prescribing unnecessary once-daily antimicrobials with broader spectrum
- Our experience shows OPAT with continuous infusion is safe and feasible practice not only for efficient bed utilizations and medical cost savings but also for better antimicrobial stewardship

Conflict of Interest: We declare no conflict of interest