ข้อมูลขนาดยาต้านจุลชีพที่ควบคุม 9 รายการ

Medication	CrCL (ml/min)	Recommended dose
1. Ertapenem (1 gm/vial)	**Normal Renal Function (Reference dose)**	**1 gm q24h**
	> 30-90	1 gm q24h
	< 30	0.5 gm q24h
	< 10	0.5 gm q24h
	Hemodialysis (HD)	0.5 gm q24h (if dosed within 6 hrs prior to HD, give 150 mg supplement AD. If dosed >6 hrs prior to HD, no AD supplement required)
[Na^+: 6 meq/vial]	CAPD	0.5 gm q24h

2. Imipenem/ Cilastatin Sodium (500 mg/vial)	**Normal Renal Function (Reference dose)**	**500 mg q6h**	**1 gm q8h**	**intermediate susceptibility 1 gm q 6h**
	≥ 60 - < 130	No dosage adjustment necessary	No dosage adjustment necessary	No dosage adjustment necessary
	≥ 30 to ≤ 60	250 mg q6h or 500 mg q8h	500 mg q8h	500 mg q6h
	≥ 15 to < 60	250 mg q8h or 500 mg q12h	500 mg q8h or 500 mg q12h	250 mg q6h
	< 15	Do not administer Imipenem/Cilastatin unless Hemodialysis is instituted within 48 hr.		
	Hemodialysis (<15)	250 – 500 mg q12h Depending on infection type and severity (AD and at intervals timed from the end of that HD session)		
[Na^+: 1.6 meq/vial]	CAPD	250-500 mg q12hr		
Extended infusion: Infusion over 3 hrs. (NSS; max conc. 5 mg/ml), **กรณีเชื้อดื้อยา**				

3. Meropenem (1 gm/vial)	**Normal Renal Function (Reference dose)**	**1 gm q8h**	**2 gm q8h**
	> 50 - 90	1 gm q8h	2 gm q8h
	25 - 50	1 gm q12h	2 gm q12h
	10 - 25	0.5 gm q12h	1 gm q12h
	< 10	0.5 gm q24h	1 gm q24h
	Hemodialysis	0.5 gm q24h (give dialysis day dose AD)	1 gm q24h (give dialysis day dose AD)
[Na^+: 3.9 meq/vial]	CAPD	0.5 gm q24h	1 gm q24h
Extended infusion: Infusion over 3 hrs. (NSS max conc. 20 mg/ml), **กรณีเชื้อดื้อยา**			

4. Ampicillin/ Sulbactam (3 gm/vial; ampicillin 2 gm + sulbactam 1 gm)	**Normal Renal Function (Reference dose)**	**Severe infection aerobic gram-negative bacilli, susceptible in vitro 3 gm q6h**	**VAP (*Acinetobacter baumannii*)* 9 gm IV drip in 1 h loading, then 9 gm IV drip in 4 h q6h** (combination therapy)
	> 90	3 gm q6h	9 gm q6h (sulb: 12 gm/day)
	> 50 - 90		9 gm q8h (sulb: 9 gm/day)
	10 - 50	3 gm q8-12h	9 gm q12h (sulb: 6 gm/day)
	< 10	3 gm q24h	9 gm q24h (sulb: 3 gm/day)
	Hemodialysis	3 gm q24h (give AD on dialysis day)	***ref for high dose: Eur J of pharm Sci 2019, 136: 104940**
[Na^+: 10 meq/vial]	CAPD	3 gm q24h	
Extended infusion: Infusion over 4 hrs. (NSS; max conc. Amp/sulb. 30/15 mg/ml), **กรณีเชื้อดื้อยา**			

5. Cefoperazone /Sulbactam (1 gm/vial; Cefoperazone 500 mg + sulbactam 500 mg) [Na^+: 2.75 meq/vial]	**Normal Renal Function (Reference dose)**	**Non-*A.Baumanii* (Cefoperazone component*)**
	> 30	1 to 2 gm q12h
	15 - 30	1 gm q12h
	< 15	500 mg q12h

Medication	Recommended dose

5. Cefoperazone /Sulbactam (cont.)

A.Baumanii **(อ้างอิงตาม MIC**), 40% T>MIC, VAP patient (albumin 2.5-3.2 g/dl)**

CrCL (ml/min)	กรณีเชื้อไวต่อยา (sulbactam 3-4 gm/day/*)	กรณีเชื้อดื้อต่อยาปานกลาง (sulbactam 6-8 gm/day/*)	กรณีเชื้อดื้อต่อยา (sulbactam 9-12 gm/day*)	
	MIC: 4	**MIC: 8**	**MIC: 16**	**MIC: 32**
90-120	Sulperazone 2 gm q8h (4h)$ (ได้ sulbactam 3 gm/day)	Sulperazone 4 gm q8h (4h) (ได้ sulbactam 6 gm/day)	Sulperazone 4 gm q8h (4h) + Unasyn 3 gm q 8 h (4h) (sulbactam 9 gm/day)	Sulperazone 4 gm q8h (4h) + Unasyn 6 gm q 8 h (4h) (sulbactam 12 gm/day)
60-89.9	Sulperazone 2 gm q 8 h (1h) (ได้ sulbactam 3 gm/day)	Sulperazone 4 gm q 8 h (1h) (ได้ sulbactam 6 gm/day)	Sulperazone 4 gm q 8 h (4h) (ได้ sulbactam 6 gm/day)	Sulperazone 4 gm q 8 h (4h) + Unasyn 6 gm q 8 h (4h) (sulbactam 12 gm/day)
30-59.9	Sulperazone 2 gm q 8 h (1h) (ได้ sulbactam 3 gm/day)	Sulperazone 2 gm q 8 h (1h) (ได้ sulbactam 3 gm/day)	Sulperazone 4 gm q 8 h (1h) (ได้ sulbactam 6 gm/day)	Sulperazone 4 gm q 6 h (4h) (sulbactam 8 gm/day)
15-29.9	Sulperazone 2 gm q 8 h (1h) (ได้ sulbactam 3 gm/day)	Sulperazone 2 gm q 8 h (1h) (ได้ sulbactam 3 gm/day)	Sulperazone 4 gm q 8 h (1h) (ได้ sulbactam 6 gm/day)	Sulperazone 4 gm q 8 h (4h) (sulbactam 6 gm/day)

หมายเหตุ: หากไม่ต้องการ cover *P. aeruginosa* อาจพิจารณาใช้ sulbactam จากยา Ampicillin/sulbactam เพื่อลด S/E จากการใช้ Cefoperazone high dose

$ (h): hour of extended infusion

* Cefoperazone ขนาดมากกว่า 4.5 gm/day ควร add vit K 10 mg/wk เพื่อป้องกันการเกิด thrombocytopenia

** Scandinavian Journal of Infectious Diseases, 2007; 39:38-43, European Journal of Pharmaceutical Sciences 136(2019) 104940

J Antimicrob Chemother 1998;42(6):793-802

[Na^+: 2.75 meq/vial]

Extended infusion: Infusion over 4 hrs. (NSS; max conc. of Cefoperazone 50 mg/ml), **กรณีเชื้อดื้อยา**

6. Piperacillin/ Tazobactam (4.5 gm/vial; Piperacillin 4 gm + Tazobactam 500 mg)

[Na^+: 9.4 meq/vial]

Normal Renal Function (Reference dose)	Non-Pseudomonas 3.375 gm q6h (over 30 min)	Anti-Pseudomonas/ Severe infection 4.5 gm q6h (over 30 min)
> 40	3.375 gm q6h	4.5 gm q6h
20-40	2.25 gm q6h	3.375 gm q6h or 4.5 gm q8h
< 20	2.25 gm q8h	2.25 gm IV q6h or 4.5 gm q12h
Hemodialysis	2.25 gm q12h (+ extra 0.75 gm AD)	2.25 gm IV q8h or 4.5 gm q12h (+ extra 0.75 gm AD)
CAPD	2.25 gm q12h	2.25 gm q8h or 4.5 gm q12h

Extended infusion: Infusion over 4 hrs. (NSS, D5W; max conc. 80 mg/ml of Piperacillin), **กรณีเชื้อดื้อยา**

7. Fosfomycin inj. (4 gm/vial)

[Na^+: 57.6 meq/vial]

Normal Renal Function (Reference dose)	Osteomyelitis 12-24 gm/day (divided q8-12h)	Complicated UTI 12-16 gm/day (divided q8-12h)	Nosocomial Pneumonia (HAP) 12-24 gm/day (divided q8-12h)	Meningitis 16-24 gm/day (divided q6-8h)
>40	No dosage modification			
40	70% of normal (in 2-3 divided doses)			
30	60% of normal (in 2-3 divided doses)			
20	40% of normal (in 2-3 divided doses)			
10	20% of normal (in 2-3 divided doses)			
HD	2 gm q48h (at end of each dialysis session)			

* Recommended duration of infusion: 2 gm (15 min), 4 gm (30 min), 6 gm (45 min), 8 gm (60 min)

* Extending the infusion time (up to 4 hrs) may reduce the risk of hypokalemia in high risk patients.

**** Maximum dose: 8 gm/dose, Max conc. 50-100 mg/ml**

8. Fosfomycin oral (3 gm/sac.)

- **Lower UTI*:** 3 gm single dose
- **Pregnancy:** 3 gm single dose
- **Complicated UTI**:** 3 gm x 3 dose (day 0, 3, 5)
- **Peri-op prophylaxis UTI***:** 3 gm ก่อนผ่าตัด 3 h then 3 gm หลังผ่าตัด 24 h

* ติดเชื้อ *E.feacium* หรือ *E.faecalis* ที่ดื้อยา Ampicillin, ได้รับเชื้อดื้อยา Extended-spectrum cephalosporin resistance (ESCR) และ Fluoroquinolones resistant enterobacteriacae, มีประวัติแพ้ยาฆ่าเชื้อทั้ง 3 กลุ่ม คือ Nitrofurantoin, Fluoroquinolones และ Sulphonamide Group

** Abnormal structural urinary tract such as stone, neurogenic bladder, kidney transplant, BPH, Recurrent UTI

***** ในผู้ป่วยเคยได้รับยาปฏิชีวนะรักษา UTI ในช่วง 3 เดือนที่ผ่านมา หรือเคยตรวจปัสสาวะพบ colonization ของเชื้อ ESCR**

9. Colistin Neb.	**Inhalation therapy:** 50-75 mg CBA in 3-4 ml saline via vibrating mesh Nebulizer 2-3 times/day **Bronchiectasis, pulmonary colonization/infection with susceptible organism in cystic fibrosis and non-cystic fibrosis patients (off-label use/route):** Inhalation: 30-150 mg CBA via nebulizer 1-2 times daily (maximum dose: 150 mg CBA 2 times daily)
	***Preparation immediately prior to administration is recommended.**

10. Colistin IV (150 mg/vial)

[Na^+: 1.04 meq/vial]

Renal Function CrCL (ml/min) [a, b]	Recommended dose	
	Loading dose	Daily Dose [c]
> 80	300 mg	150 mg q 8-12 h
> 40-80	300 mg	150 mg q 12 h
> 20-40	300 mg	100 mg q 12 h
≤ 20	300 mg	150 mg q 24 h
Intermittent HD	300 mg	Dialysis day - 200 mg after dialysis Non-dialysis day - 150 mg q 24 h
SLED	300 mg	SLED day - 150 mg q 12 h Non-SLED day - 150 mg q 24 h
CRRT	300 mg	150 mg q 8 h
CAPD	300 mg	100 mg q 24 h

Note

- Loading dose: iv drip in 1 hour
- Maintenance dose: iv drip in 30 mins

[a] Creatinine Clearance คำนวณจาก Cockcroft-Gault formula

Creatinine Clearance $= \frac{[140-a \quad (yr)]\ x\ wei \quad (kg)}{[72\ x\ SCr\ (mg\ /dL)}$

[b]ป่วยที่มีน้ำ2280454
หนัก < 35 Kg หรือ > 70 Kg ควรใช้ Ideal Body Weight (IBW) ในการคำนวณ Creatinine Clearance

[c]Colistin Base Activity

*ดัดแปลงจาก Clin Infect Dis 2017;64:565-71
***สาขาวิชาโรคติดเชื้อและอายุรศาสตร์เขตร้อนภาควิชาอายุรศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล มีนาคม พ.ศ.2560*

11. Vancomycin inj. (500 mg/vial)

Renal Function CrCL (ml/min)	**Loading Dose: critically ill patient; 20 – 35 mg/kg (Max: 3 gm/day)** **Maintenance Dose (MD)**
> 90	15 mg/kg q 8-12 h
51 – 89	10-20 mg/kg q 12 h
30 – 50	10-15 mg/kg q 12 h to 20 mg/kg q 24 h
10 – 29	10-15 mg/kg q 24 h to 15 mg/kg q 48 h
< 10 or AKI* ***dose by level***	15 mg/kg x1 dose, then dose by level
Hemodialysis	Initial: 20-25 mg/kg x 1 (max: 2 gm) Maintenance: dose by level
CRRT	Initial: 20-25 mg/kg x 1 (max: 2 gm) Maintenance: 10-15 mg/kg q 24 h
Peritoneal dialysis	10-15 mg/kg x1 dose, then dose by level
	For IP instillation (1 exchange/day; dwelling at least 6h: 15-30 mg/kg then dose by level)

Note

- Dosing: ใช้ Total Body Weight (TBW) ในการคำนวณ
- MD: Max dose 2 gm/dose and 4.5 gm/day (including loading dose)
- Maximum conc.: 5 mg/mL for peripheral administration (in need of fluid restriction, a concentration of up to 10 mg/mL may be used)
- Maximum rate: 10 mg/min
- Round doses to nearest 250 mg

12. Vancomycin oral

For *Clostridium difficille* associated diarrhea (CDAD):

Initial episode, Non severe:
125 mg PO 4 times daily for 10 days

Initial episode, Severe:
125 mg PO 4 times daily for 10 days

Initial episode, Fulminant:
500 mg PO 4 times daily for 10 days
If ileus adds on IV metronidazole 500 mg q8h should be administered together with oral or rectal vancomycin

วิธีเตรียมผสม:

1. vancomycin 500 mg + SWFI 10 mL
2. หลังผสมได้ความเข้มข้น 50 mg/mL
3. ขนาดยา 125 mg ดูด สลล. 2.5 mL
   ขนาดยา 500 mg ดูด สลล. 10 mL
4. หลังผสมยาเก็บได้ 24 ชม. ในตู้เย็น

Reference: Lexi-drugs online [database on the Internet]. Hudson (OH): Lexicomp Inc.: 2023. Available from: http://online.lexi.com.
Tamma PD, Aitken SL, Bonomo RA, Mathers AJ, van Duin D, Clancy CJ. Infectious Diseases Society of America Antimicrobial-Resistant Treatment Guidance: Gram-Negative Bacterial Infections. Infectious Diseases Society of America 2022; Version 1.1. Available at https://www.idsociety.org/practice-guideline/amr-guidance/.