Hydration

This document summarises the basis for the guidance on hydration provided for cisplatin and oxazaphosphorine containing medical oncology regimens in the ACT-NOW Systemic Anti-Cancer Therapy Regimen Library (SRL). For hydration with high dose methotrexate see Hydration and Folinic acid rescue for high dose methotrexate.

Cisplatin

Hydration value options for the SRL:

- Routine hydration recommended
- Variable

Guidance

- Sufficient hydration is essential when administering cisplatin to avoid cisplatin-induced nephrotoxicity[1]. Conversely, excessive hydration may increase patient discomfort and increase unnecessary day unit usage.
- There is strong evidence of magnesium supplementation being nephroprotective when administered prior to cisplatin [1,4].
- Potassium supplementation has not been shown to be nephroprotective[2]. However, patients with hypokalaemia may require supplementation between cycles.

Routine hydration recommended

- For all doses and days of cisplatin administration, suggested hydration varies with dose of cisplatin as follows:

cisplatin doses 99 mg/m² or less			
Medication	**Dose**	**Route**	**Instructions**
magnesium sulphate heptahydrate	10 mmol	IV	In 1000 ml sodium chloride 0.9% over 60 minutes, prior to cisplatin infusion.
cISplatin	Any dose 99 mg/m² or less	IV	• In 500 - 1000 ml of sodium chloride 0.9%, depending on stability, over 60 minutes. • Ensure patient has passed urine as per institutional policy.
sodium chloride	0.9%	IV	1000 ml over 60 minutes. If cisplatin is infused in 1000 ml, centres may choose to omit this bag of fluid.

cisplatin dose 100 mg/m² (single doses of cisplatin do not usually exceed 100 mg/m²)			
Medication	**Dose**	**Route**	**Instructions**
magnesium sulphate heptahydrate	10 mmol	IV	In 1000 ml sodium chloride 0.9% over 60 minutes, prior to cisplatin infusion.
mannitol	10%	IV	400 ml over 30 minutes. After magnesium infusion, prior to cisplatin infusion.
cISplatin	100 mg/m²	IV	• In 500 - 1000 ml of sodium chloride 0.9%, depending on stability, over 60 minutes. • Ensure patient has passed urine as per institutional policy.
sodium chloride	0.9%	IV	1000 ml over 60 minutes.

Variable

- Used in complex regimens which have different requirements for different cycles.
- Explanatory notes are included under the Supportive Care Factors section in the regimen.
- The recommended hydration is included within the regimen definition as per "Routine hydration recommended" above in those cycles where that is appropriate.

Each cancer type working group chair has the final decision as to the requirement of cisplatin hydration within an SRL regimen.

References

1. Crona, D.J.; Faso, A.; Hishijima, T.F.; McGraw, K.A. et al. A Systematic Review of Strategies to Prevent Cisplatin-Induced Nephrotoxicity. Oncologist 2017 May;22(5):609-619. DOI: 10.1634/theoncologist.2016-0319.
2. Nakamura K, Nakamura M, Onikubo T. 2017 Is highly concentrated potassium preparation necessary for cisplatin administration? Abstracts Supportive Care| Volume 28, Supplement 10, X161, November 2017.
3. Yamamoto, Y.; Watanabe, K.; Matsushita, H.; Tsukiyama, I.et al. Multivariate analysis of risk factors for cisplatin-induced nephrotoxicity in gynecological cancer. The Journal of Obstetrics and Gynaecology Research 2017 December;43(12):1880-1886. DOI: https://doi.org/10.1111/jog.13457.
4. Kubo, Y.; Miyata, H.; Sugimura, K.; Shinno, N. et al. Prophylactic Effect of Premedication with Intravenous Magnesium on Renal Dysfunction in Preoperative Cisplatin-Based Chemotherapy for Esophageal Cancer. Oncology 2019 December; 97: 319-326.
5. Saito, Y.; Kobayashi, M.; Yamada, T.; Kasashi, K. et al. Premedication with intravenous magnesium has a protective effect against cisplatin-induced nephrotoxicity. Supportive Care in Cancer 2017 25:481-487.

Oxazaphosphorines – ifosfamide and cyclophosphamide

Hydration value options for the SRL:

- Routine hydration recommended
- Hydration may be considered
- Variable

Guidance

- Patients require at least 2000 to 3000 ml daily as oral or IV fluids on the day(s) of cyclophosphamide or ifosfamide chemotherapy.
- Patients should be encouraged to be well hydrated 24 to 72 hours prior to and after chemotherapy and to void urine often.
- Urine output should be maintained at 100 ml/hour.
- Urine should be monitored for haematuria and proteinuria throughout the treatment period.
- No specific hydration recommendations are included for low dose cyclophosphamide (750 mg/m^2/dose or less).

For guidance on mesna uroprotection with oxazaphosphorine-containing regimens, see Mesna uroprotection.

Routine hydration is recommended

Oxazaphosphorine	Hydration included in SRL regimens	Instructions
IFOSFamide (all doses)	1000 ml sodium chloride 0.9% IV over 120 minutes prior to ifosfamide	Recommended daily hydration is 3000 ml per day as oral or IV fluid on day(s) of ifosfamide and for 24 hours after or as per institutional practice
	ifosfamide IV infusion over prescribed time	
	1000 ml sodium chloride 0.9% IV over 120 minutes after ifosfamide	
High dose CYCLOPHOSPHamide single dose ≥ 1500 mg/m^2/dose or < 2000 mg/m^2/dose	1000 ml sodium chloride 0.9% IV over 120 minutes prior to cyclophosphamide	Consider hydration with at least 3000 ml over 24 hours as oral or IV fluid on day(s) of cyclophosphamide and for 24 hours after or as per institutional practice.
	cyclophosphamide IV infusion over prescribed time	
	1000 ml sodium chloride 0.9% IV over 120 minutes after cyclophosphamide	

Hydration may be considered

Oxazaphosphorine	Instructions only included in SRL regimens
Intermediate dose CYCLOPHOSPHamide > 750 mg/m^2 and < 1500 mg/m^2/dose	Consider hydration with at least 2000 to 3000 ml over 24 hours as oral or IV fluid on day(s) of cyclophosphamide and for 24 hours after or as per institutional practice.

Variable

- Used in complex regimens which have different requirements for different cycles.
- Explanatory notes are included under the Supportive Care Factors section of the regimen.
- The recommended hydration or instructions are included within the regimen definition as per "Routine hydration recommended" above in those cycles where that is appropriate.

Each cancer type working group chair has the final decision as to the requirement of oxazaphosphorine (ifosfamide or cyclophosphamide) hydration within an SRL regimen.

References

1. Baxter Healthcare Ltd. Holoxan New Zealand data sheet 19 June 2018 https://www.medsafe.govt.nz/profs/datasheet/h/Holoxaninj.pdf (Accessed 10 June 2022).
2. Baxter Healthcare Ltd. Endoxan New Zealand data sheet 1 August 2018 https://www.medsafe.govt.nz/profs/datasheet/e/Endoxaninj.pdf (Accessed 10 June 2022).
3. Baxter Healthcare Ltd. Uromexitan New Zealand data sheet 17 September 2019 https://www.medsafe.govt.nz/profs/datasheet/u/Uromitexaninj.pdf (Accessed 10 June 2022).
4. BCCA Cancer Drug Manual Monograph Cyclophosphamide 1 June 2013 http://www.bccancer.bc.ca/drug-database-site/Drug%20Index/Cyclophosphamide_monograph_1June2013_formatted.pdf (Accessed 13 June 2022).
5. BCCA Cancer Drug Manual Monograph Ifosfamide 1 June 2010 http://www.bccancer.bc.ca/drug-database-site/Drug%20Index/Ifosfamide_monograph_1June2010_formatted.pdf (Accessed 10 June 2022).
6. Robinson D, Schulz G, Langley R, et al. Evidence-Based Practice Recommendations for Hydration in Children and Adolescents With Cancer Receiving Intravenous Cyclophosphamide. J Pediatr Oncol Nurs. 2014 Jul;31(4):191-199. PMID: 24799445.

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