

Introduction to intravenous (IV) fluids

Online learning course outline

An overview on electrolytes, body fluids and IV fluids			
Topic	Presenter	Learning objectives	Competency standards*
Overview of body fluids and electrolytes	Simon Potts , <i>Senior Pharmacist, Intensive Care Unit, Flinders Medical Centre, Adelaide, SA</i>	<ul style="list-style-type: none"> Identify the major electrolytes present in the body and their sources. Explain the movement of fluid and electrolytes into, within, and out of the body. Explain the function of each of the major electrolytes. Describe how the body naturally maintains electrolyte balance. Explain how much fluid and each of the major electrolytes a person needs 	1.5.1, 1.5.2, 3.1.2
Deep dive into IV fluids, including administration and compatibility. An overview of smart pumps	Gene Chai , <i>Lead Pharmacist, Intensive Care Unit, Alfred Health, Melbourne, Vic</i>	<ul style="list-style-type: none"> Identify types of IV fluids used in clinical practice, including their applications and contraindications. Explain the importance of selecting the appropriate administration site for each type of IV fluid Describe factors that impact IV fluid selection and administration type. Describe the pharmacist role in monitoring IV fluids. Explain the purpose of smart pumps in delivering IV medications Identify types of medication errors that smart pumps can help prevent. 	1.1.2, 1.5.1, 3.1.2, 3.2.3, 3.3.1
Parenteral nutrition	Tiffany Gardner , <i>Senior Clinical Dietitian, Intensive Care Unit, Flinders Medical Centre, Adelaide, SA</i>	<ul style="list-style-type: none"> Identify indications for total parental nutrition (TPN) Describe the potential constituents of a TPN solution and their roles in nutrition. Explain how to manage potential complications of TPN therapy. Outline the steps for compounding TPN solutions. 	3.4.1, 3.4.3, 3.4.2

Foundational principles – Effects of IV fluids on clinical and biochemical parameters			
<p>Overview of fluid types: Na, Ca, K, PO₄ and Mg, and interpreting associated laboratory results</p>	<p>Gemma Clark, <i>Clinical Pharmacist, The Prince Charles Hospital, Brisbane, Qld</i></p>	<ul style="list-style-type: none"> • Explain the roles of Na, Ca, K, PO₄ and Mg in maintaining homeostasis. • Identify the most common electrolytes administered intravenously. • Explain the characteristics, including administration, of these electrolytes. • Interpret laboratory results for patients receiving electrolyte replacement therapy and other IV fluids • Explain the significance and implications of fluid balance data on a patient's clinical condition and treatment plan. • Develop strategies for managing IV fluids for patients with various medical conditions and fluid requirements. 	<p>1.5.2, 2.4.1, 3.1.2, 3.2.1,3.3.2</p>
<p>Maintenance hydration and fluid resuscitation</p>		<ul style="list-style-type: none"> • Define the terms 'maintenance hydration' and 'fluid resuscitation'. • Recognise the signs and symptoms of dehydration and fluid overload in patients of all ages. • Compare oral and intravenous fluid administration, including indications and limitations. • Discuss types of fluid resuscitation including crystalloids, colloids, and blood products 	<p>1.5.2, 3.1.2, 3.2.4, 3.3.2</p>
Fluid replacement			
<p>Fluid replacement in special populations: Patients with heart failure</p>	<p>Rayan Nabizada, <i>Registrar Candidate, Emergency Medicine, Monash Health, Melbourne, Vic</i></p>	<ul style="list-style-type: none"> • Explain the importance of fluid management in patients with heart failure (HF) • Identify the pharmacological and physiological factors that influence fluid balance in patients with HF. • Explain considerations and strategies for fluid replacement in patients with HF • Evaluate the risks and benefits of aggressive versus conservative fluid therapy. • Develop a management plan for fluid replacement therapy for patients with HF. 	<p>3.1.2, 3.1.3, 3.2.1, 3.2.3, 3.3.2</p>
<p>Self-directed case study: IV potassium</p>	<p>Alessandra Rose, <i>Pharmacist - Advance Training Resident, Royal</i></p>	<ul style="list-style-type: none"> • Identify potential causes of electrolyte disturbance. • Interpret patient laboratory data to determine appropriate electrolyte 	<p>1.6.2, 3.1.2, 3.2.1, 3.2.3, 3.3.1</p>

	<i>Brisbane and Women's Hospital, Brisbane, Qld</i>	<p>replacement therapy, including dose and route of administration.</p> <ul style="list-style-type: none"> • Identify steps used to monitor patients receiving intravenous (IV) potassium. • Summarise ways to manage adverse effects related to electrolyte replacement therapy and electrolyte disturbance. 	
Self-directed case study: patients with complex lines	Sophie Anderson, <i>Advanced Training Resident - Emergency Medicine, Royal Brisbane and Women's Hospital, Brisbane, Qld</i>	<ul style="list-style-type: none"> • Identify types of complex medication administration systems. • Identify factors that can affect IV fluid compatibility. • Summarise strategies to manage and prevent adverse events related to complex lines. • Develop management plans for patients with complex lines. • Explain how to document clinical findings clearly and concisely. 	3.1.2, 3.2.3, 3.2.4, 3.3.1, 3.3.2, 3.3.3
Self-directed case study: heparin	Negin Nasseh-Samimi, <i>ICU Pharmacist, Royal Brisbane and Women's Hospital, Brisbane, Qld</i>	<ul style="list-style-type: none"> • Identify clinical indications for heparin therapy. • Identify advantages and disadvantages of using heparin therapy. • Compare heparin therapy to other anticoagulants. • Assess the safety and suitability of an order for heparin therapy. • Describe strategies to prevent adverse events related to heparin administration. • Explain how to document clinical findings clearly and concisely. 	3.1.2, 3.2.3, 3.2.4, 3.3.1, 3.3.2, 3.3.3
Resources			
Overview of resources to support IV fluid management	Simon Potts, <i>Senior Pharmacist, Intensive Care Unit, Flinders Medical Centre, Adelaide, SA</i>	<ul style="list-style-type: none"> • Identify evidence-based resources on IV fluids. • Explain the use of these resources in clinical practice 	5.2.3, 5.3.1, 5.3.3