

# Curriculum Vaccines and Vaccination

## Health Care Providers Health care Students

Training Content

Module		Target group	Minimum Content Basic Curriculum	MAXIMUM content In depth Education	Learning outcome
	Topic	<b>STU</b> (student/ pre service) <b>HCP</b> (Health care provider/ In-service)	<i>This represents the minimum material that all trainers/curriculum managers should include in STU/HCP training, to be presented in the format and order most suitable to the students' existing knowledge and needs</i>	<i>This represents material which may be presented additionally to STU/HCP, depending on existing knowledge of students (based on assessment) and their anticipated role in delivering vaccines.</i>	
Rationale, context and history of immunisation	History	STU	Vaccines in their historical perspective		Learn from the past to better answer questions about vaccines and understand the context of vaccinology
		STU/HCP	historical impact of vaccine-preventable diseases		
	Context	STU/HCP	The rationale for implementing immunisation programmes		
		STU/HCP	Concepts of control, elimination and eradication related to vaccine-preventable diseases in historical perspective, including the importance of herd immunity		
		STU/HCP		Long term implications of vaccine programmes	

		STU/HCP		“One Health” approach ( <u>One Health (who.int)</u> )	
	<b>Definitions</b>	STU/HCP	List of different key-words + explanation		Understand conversation about all topics of vaccines and vaccination
	Stakeholders	STU	Who is involved		Knowing all stakeholders and their role in the vaccination process
		STU/HCP	Role of all stakeholders in the vaccination process focusing on the health care providers		
STU/HCP			National/region legislations, Professional guidelines and directives: CanMEDS Physician Competency Framework EU directive 2013/55/EC (EFN Competency Framework)		
<b>Vaccine Immunology and immunopathology</b>	<b>Immune system</b>	STU	Introduction to the Immune System		Explain what the role is of the immune system to people interested in vaccination
		STU/HCP	Compare innate and adaptive immunity		
		STU/HCP	State the functions of B-cells and T-cells		
	<b>Immune response</b>	STU/HCP	The role of antibodies and antigens		Explain the role of the immune system after vaccination
		STU/HCP	Vaccine-induced vs. naturally gained immunity		
		STU/HCP	Immune response to a vaccine	Immune response to innovative vaccines (incl Therapeutic vaccines)	
		STU/HCP	List conditions that affect the immune response		
		STU/HCP	Assessment of the capacity of the immune system		
		STU/HCP	Primary and secondary immune response (booster)		
		STU/HCP	Vaccines and immunological memory; how long does a vaccine		

			protect against a vaccine-preventable disease		
		STU/HCP		Immune system of new-borns, pregnant women and elderly	
		STU/HCP		The role of maternal antibodies	
		HCP		Immunology and cancer	
		HCP		Mucosal immunity	
		HCP		Interactions between the immune system and microbiota	
		STU/HCP	Key words/ key abbreviation list		

<b>Key aspects vaccine safety, development, quality</b>	<b>s of Vaccine</b>	Vaccine	STU	Definition of a vaccine		Explain the different types of vaccines and their composition – the importance of intervals of schedules
			STU/HCP	Prophylactic and Therapeutic vaccines		
			STU/HCP	The components and composition of vaccines, incl. vaccine adjuvants, and explain their function		
			STU/HCP		In dept, the role of the different adjuvants	
			STU/HCP	different types of vaccines		
			STU/HCP	Co-administration of vaccines and importance of intervals between vaccines/schedules		
			HCP		Switching between vaccines of different manufacturers	
	Side-effects and limitations	STU/HCP	Expected side-effects per type of vaccine, limitations and non-specific effects		Identify and explain possible side effects and contra indications of the different vaccines	
		STU/HCP	Assessment of causal relationships between vaccines and side-effects			
		STU/HCP	Contraindications for each type of vaccine			
		STU/HCP	Vaccination before pregnancy (child wish), during pregnancy and during breastfeeding			

Vaccine development	STU/HCP	The stages in vaccine development, including quality management: <ul style="list-style-type: none"> <li>- discovery,</li> <li>- preclinical testing,</li> <li>- process development,</li> <li>- manufacturing,</li> <li>- clinical development,</li> <li>- immune response analysis,</li> <li>- regulatory affairs,</li> <li>- activity outsourcing</li> <li>- GMP, ICH Guidelines of Good Clinical Practice</li> </ul>		You can answer questions of patients (laymen) on the development of vaccines
	STU/HCP	Clinical Vaccine trials – Why, When, how		
	HCP		difference between pharmacovigilance (after authorisation) and clinical trial information	
	STU/HCP		Funding sources for vaccine development and research	
	STU/HCP		Criteria of the vaccine industry for the choice of developing a new vaccine; Go / no-Go in the vaccine development process	
	STU/HCP	The role of animal science in vaccine development		
Vaccine safety and quality	STU/HCP	Procedures of safety control and monitoring of efficacy: difference between pharmacovigilance (after authorisation) and clinical trial information		Explain how safety of vaccines can be secured
	STU/HCP	Role of regulatory agencies in vaccine testing and licensure		
Vaccine manufacturing	STU/HCP	List Vaccine manufacturers		Explain the role of industry in the vaccination process
	STU/HCP		The importance of GMP in production of vaccines	

		STU/HCP		Role of vaccine industry for meeting global needs; Globalisation of vaccine production	
		HCP		Vaccine Manufacturing	
		STU/HCP		Explain procedures related with emergency use authorization	
		STU/HCP		Vaccine availability issues -out of stock issues	
<b>Vaccine preventable diseases</b>	Disease epidemiology	STU/HCP	the epidemiology and pathology (nature, frequency, infection, transmission, effects, incubation, symptoms, complications, surveillance, mutations), incidence, prevalence, burden of disease, degree of endemicity for each disease		Explain the severity of the vaccine preventable disease (in your country)
		STU/HCP		Pathogen variability and host-pathogen interactions	
		STU/HCP	The current prevalence and/or incidence of each disease (in your country)	The current prevalence and/or incidence of each disease, in Europe and on a global scale	
			Disease prevention and management (outbreak management) – how to prevent spread of disease		
	Vaccine strategy	STU	The importance of pathogens for vaccination strategies		Explain why vaccines are recommended or mandatory for certain people in your country (region)
		STU/HCP	The population at risk for each disease; elaborate on immune compromised individuals, travellers, healthcare personnel, different age groups, pregnant women, occupational risk groups, patient risk groups, ...		

		HCP		Preventive measures can be taken for each disease	
		STU/HCP	Historical impact of vaccination on the epidemiology and the burden of disease of the relevant diseases.		
	Source of information	STU/HCP	sources of information about the diseases, epidemiology and their vaccines / list (local) reliable sources for vaccine information		Know where to find information on vaccine preventable disease and vaccines
Immunization policy and schedules	Infection Control	STU/HCP	infections spread; outbreaks and control		Explain how prevention can stop the spread of a disease and why prevention activities including vaccines are installed.
		STU/HCP	Herd immunity and its importance		
		HCP (STU)		why mathematical modelling of diseases is used and how it is a tool in analysing vaccine policy options	
		STU/HCP		The role of economic evaluation of a vaccination programme	
		STU/HCP		Funding of vaccination programs and vaccines , including cost-effectiveness/cost-benefit	
	Vaccine policy	STU/HCP	The different factors and stakeholders involved in evidence based policy decisions		You can explain which stakeholders are involved in the vaccination policies that affects the person who asked the question and how decisions are taken
		STU/HCP	How national schedules are defined; which vaccines are part of routine immunization schedules and which vaccines are recommended additionally		
		STU/HCP		Country specific immunization program management	

		STU/HCP	The organisation and role of disease surveillance systems		
		STU/HCP	Legislation – ethical issues on mandatory vs voluntary vaccination; Should we enforce mandatory vaccination?		
		STU		How to develop a new program of immunization	
	Vaccination coverage/ monitoring	STU/HCP	Vaccination monitoring – Immunization reporting system		Explain the success or failure of the vaccination program
		STU/HCP		Why and how to document a vaccination correctly in all relevant records	
		STU/HCP	The role and importance of vaccination coverage data		
		STU/HCP	Name factors that influence immunisation coverage		
		STU/HCP		Success stories in under-served populations (migrants, prison, special religious groups ....) and how to follow up migrant populations (tailored immunization programs)	
		STU/HCP		Historical changes in national vaccination programs	
		STU/HCP		Differences in access to vaccination in different countries and on a global level	
	STU/HCP	How immunisation programmes are monitored and evaluated (importance of post-vaccination surveillance, how to record vaccine related adverse effects)			
	STU/HCP		How to Access and use current vaccine schedules, deal with variations and find their updates		
	STU/HCP		Catch-up campaigns, vaccine registration, outbreak response		

				and vaccination policy towards special populations	
		HCP	Vaccination coverage by age for vaccine-preventable-diseases such as measles, flu, HPV and COVID-19		
Future perspectives	New Vaccines	STU/HCP	List new target diseases		Explain what vaccines can be expected in the future
		STU		Processes of early clinical development	
		STU/HCP	Which vaccines are in the pipeline		
		STU/HCP		New Therapeutic vaccines	
	New administration techniques	STU/HCP	New ways of administration		Knowing which new techniques will be available soon.
		HCP		Current research on components and techniques, eg. Vaccinomics: the future of vaccinology?	
		HCP		Current developments for HIV, dengue, malaria, hepatitis C, ...	
		HCP		Fighting co-infection by vaccination	
		STU		Education and formation in vaccinology: new methods	
	Understanding, active listening and communication	Understanding behaviour and barriers & active listening	STU/HCP	Determinants of vaccine hesitancy/acceptance: Understand issues that affect and influence potential vaccinees, parents and caregivers in their decision-making and acceptance of vaccination	
STU/HCP			Understand the importance of public perception		
STU/HCP			Understand provider-patient negotiation		



				Respect differing views through listening	
		STU/HCP	Listen non-judgmentally to health beliefs and research parents do about vaccination		
		STU/HCP	Acknowledge the anxiety of individuals		
		HCP	Gain insight in the perceptions and attitudes of the different population and of health care workers towards (specific) vaccines (how do concerns vary in the different groups and how should communication should be adapted)		
		STU/HCP	Understand the difference between vaccine hesitancy and antivax sentiments. the need to avoid 'categorising' people: every case is different and requires a different approach. Adapt Languages/words		
		STU/HCP		Insight in current anti-vax and vaccine hesitancy (data)	
		HCP	Understand the relation between vaccine hesitancy and vaccine refusal/acceptance		
		STU/HCP	Acknowledge the role of the health care worker in vaccine acceptance. How to build a relation based on trust		
	<b>Communication Theory and practice</b>	STU/HCP	Principles of communication on vaccination <ul style="list-style-type: none"> <li>○ Monitoring &amp; research,</li> <li>○ content of the message,</li> <li>○ formulation of the message,</li> <li>○ messenger, receiver (target group)</li> <li>○ channels</li> </ul>		Possess the communication skills to improve vaccine acceptance

	STU/HCP	Be committed to offer the best professional advice on vaccination	
	STU/HCP	How to communicate about vaccine effects and the role of vaccination among other preventive measures	
	STU/HCP	State key facts, advantages and risks that need to be communicated	
	STU/HCP	Understand behavioural science principles to influence and change behaviour on vaccination; risk communication. communicating about uncertainty in science, side effects	
	STU/HCP	Myths/ misconceptions and facts relating to (current) immunisation controversies	
	STU/HCP	How to communicate and combat/debunk myths and misconceptions	
	STU/HCP		Critically evaluate media reporting of vaccine issues, understand the impact of social media & how to respond
	STU/HCP	How to talk to the media (media training)	
	STU/HCP	How to deliver vaccinology-related messages to different subgroups / underserved populations	
	STU/HCP	List key points for responding to parents' fear	
	STU/HCP		Respond to objections raised by anti-vaccine movements, with careful consideration of the potential impact

		HCP	Direct others to reliable and appropriate sources of trustworthy vaccine information		
		STU/HCP		Lessons learnt from the previous pandemic (COVID-19, Flu) – the defining role of Communication in this period	
<b>Practical skills</b>	<b>Administration – theory</b>	STU/HCP	Description of a correct immunisation site		Knowing the theoretical approach of all steps that will be necessary to administer vaccines. It may help to explain the vaccinee what will happen and why (vaccine confidence).
		STU/HCP	Different immunisation techniques + perform		
		STU/HCP	cold chain and the importance of its maintenance		
		HCP		Specify minimum/maximum temperatures for vaccine storage	
		STU/HCP	Identify vaccine sensitivity to light, heat and freezing		
		STU/HCP	Differences between vaccination of children, newborns and adults		
		STU/HCP	Correct dose and site of administration of all vaccines for each age group		
		STU/HCP	Overview of contraindications and side effects to be monitored		
		STU/HCP	Anaphylactic shock (Distinguish between anaphylaxis and fainting)		
	Administration Practice	STU/HCP	Check if all material/ safety concerns are available in the vaccination room/place		You know how to administer correctly a vaccine and you can perform is independently and correctly
		STU/HCP	Prepare and dispose vaccination equipment; waste management		
		STU/HCP	Assess if a patient is fit to receive safe and effective vaccination (assess contraindications/previous adverse reactions )		
STU/HCP		Prepare vaccines, Reconstitute vaccines correctly			

		STU/HCP	Correct Administration (practice theory)		
		STU/HCP	Monitor possible side effects (inclusive anaphylactic shock) Early identification of signs and symptoms of occurrence of adverse reactions and anaphylactic reactions	Repeat if needed: interventions to coop side effects and anaphylactic reaction (life support)	
		STU/HCP		Communication tips to limit fear and build vaccination trust	
		STU/HCP	Vaccine and side effect registration		