Malaysian Guidelines on SARS-CoV-2 Vaccines in Patients with Kidney Diseases

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Which type of vaccines are available and suitable?

WHO reported over 200 COVID-19 vaccines in development and more than 60 vaccine candidates in clinical development. At least 7 vaccines across 3 platforms have been rolled out in many countries.[1] Vaccines in Phase 3 studies fall into 5 main categories[2]: *(Refer to Table 1 for specific COVID-19 vaccines)*

a. mRNA vaccines: e.g. Pfizer-BioNTech, Moderna, Arcturus
b. virus vectored vaccines: e.g. Astra-Zeneca, Sputnik V, Can-Sino
c. inactivated virus vaccines: e.g. Sinovac, Bharat
d. protein subunit vaccines: e.g. Novavax, Sanofi-Pasteur
e. virus-like particle (VLP) vaccines: e.g. Medicago

- **Chronic Kidney Disease (CKD)/Dialysis Patients**
  In general, all of the above vaccine types are suitable to be used in patients with CKD or on dialysis, provided there are no specific contraindications.

- **Patients on immunosuppressants**
  Patients with glomerulonephritis or currently on immunosuppressive drugs to follow the guideline for kidney transplant recipients.

- **Kidney Transplant Recipients**
  Transplant recipients have been excluded in all major trials for COVID-19 vaccines hence neither efficacy, durability nor safety is known in this population. Based on previous experience of using other viral vaccines and scientific basis, COVID-19 vaccination is recommended when it becomes available.

  - Live attenuated vaccines are contraindicated[3], however currently there are no live attenuated COVID-19 vaccine approved for use or in Phase 3 trial.
  - Vaccines that use another replicating viral vector (VVr) e.g. adenovirus are contraindicated in kidney transplant recipients.[3]
  - Inactivated vaccines are safe and preferred in kidney transplant recipients.[2,4-5]
  - mRNA vaccines using lipid nanoparticle (LNP) for transport into cells are also safe.[2,4-5]
  - Protein subunit/recombinant vaccines are also safe.[2,4-5]

When to administer COVID-19 vaccine?

- **CKD and Dialysis Patients**
  In general, vaccination in CKD and dialysis patients can be given at any time when it is available.

- **Patients receiving or recently received immunosuppression**
  Immunocompromised patients due to disease (e.g. glomerulonephritis) or treatment are vulnerable and should be vaccinated at any time when it is available .

- **Kidney Transplant Recipients**

  - All transplant recipients, transplant candidates and their household members should receive vaccination when it is available.[2]
  - More than 2 weeks prior to transplantation[2,4], or 3 months after transplantation.
  - It is not necessary to postpone transplant. If transplant happens between 1st and 2nd dose of vaccine, the 2nd dose should be given at least 1 month after transplantation.
  - If received B cell depleting therapy (e.g. Rituximab), to give vaccine after 3 months.[4]
  - If received treatment for acute rejection (e.g. pulse steroids), should wait at least 1 month prior to vaccination depending on types of treatment.[4]

Footnote:

- The recommendation to postpone vaccination is kidney transplant recipients or those receiving treatment for acute rejection is mainly for the concern on reduced efficacy.
- Those recovered from COVID-19 should wait at least 3 months from diagnosis and symptoms recovery before receiving vaccination.[2,4.]
- Viral testing to assess for acute COVID-19 infection or serologic testing to assess prior infection for the purpose of vaccine decision making is not recommended.
- Concomitant administration with other types of vaccines is not recommended. If it is done, it should be separated by at least 2 weeks.[2,4]

Who should NOT receive the vaccine?

- Age younger than 18[6]
- Anyone with known allergy or anaphylactic reaction to the vaccine or components of the vaccine.[5]

Special note:

- In view of lack of involvement of pregnant women in major COVID-19 vaccine trials and yet evolving evidence, recommend to follow MOH latest recommendations. (Studies of Pfizer-BioNTech vaccine in pregnant women is ongoing)[5]
- There is neither data on safety of the COVID-19 vaccines on lactating mothers and breastfed infants, nor on milk production/excretion.[5]

How efficacious is the vaccine?

The approved mRNA vaccine, Pfizer-BioNTech, showed 95% efficacy[7] in preventing COVID-19 disease and the Moderna vaccine demonstrated 94.1% efficacy in Phase 3 trial[8]. The efficacy of the adenovirus vector vaccine is 62 – 92%.[9] However, the efficacy in patients with CKD and dialysis patients as well as transplant recipients is expected to be reduced due to immunocompromised state.

Hence, patients who have received COVID-19 vaccine should still continue to observe all preventive measures such as masking, hand hygiene and physical distancing.

What are the potential adverse effects of the vaccine?

- Potential adverse effects are as listed below.[6-12]

Common:

Local (At site of injection)	Systemic
• Pain (61%), swelling (16%) • Redness (erythema) 7% or rash • Lymphadenopathy – axilla and supraclavicular (may last up to few weeks) • Delayed reaction of rash, itchiness and redness appearing 5 – 10 days after vaccination appearing like mild allergic reaction.	• Fever (4%), chills (6%) • Fatigue (38%) or tiredness • Myalgia (15%) and arthralgia • Headache (32%) • Nausea, diarrhoea and/or vomiting

- Rare:

(a) Anaphylaxis (all case reports responded to treatment, no death)

- Risk of anaphylaxis:[13] (as of 27th January 2021)
    i. Pfizer-BioNTech: 5 per million doses
    ii. Moderna: 3 per million doses

(b) Facial nerve palsy

- The systemic symptoms are more prominent after the second dose of vaccine.

- Patients are advised to stay within the vicinity of the vaccination centre for 15-30 minutes post vaccination to observe for any adverse events.

Other recommendations:

As there is very little data of efficacy, dose requirement and duration of immunity after COVID-19 vaccination in immunocompromised patients such as CKD and transplant recipients, it is essential to have further research studies in this area.

Table 1: Types of COVID-19 Vaccines *(Highlighted are those going to be available in Malaysia)*

Vaccine platform/type	Developers	No. of doses	Schedule days	Route	For Tx recipient
Inactivated	Sinovac	2	0, 14	IM	√
	Wuhan Institute of Biological Products/ Sinopharm	2	0, 21	IM	√
	Beijing Institute of Biological Products/ Sinopharm	2	0, 21	IM	√
	Bharat Biotech	2	0, 28	IM	√
	Institute of Medical Biology and Chinese Academy of Medical Sciences	2	0, 28	IM	√
Viral Vector ▪ **VVnr/ChAdOx1-S**	University of Oxford/ AstraZeneca	2	0, 28	IM	x
▪ **VVnr/Ad type 5**	CanSino Biological Inc/Beijing Institute of Biotechnology	1	-	IM	x
▪ **VVnr/rAd26-S + rAd5-S**	Sputnik V(Russian NRA)/Gamaleya Research Institute	2	0, 21	IM	x
▪ **VVnr/Ad type 26**	Janssen Pharmaceutical Companies	2	0, 56	IM	x
RNA/LNP encapsulated mRNA	Moderna/NIAID	2	0, 28	IM	√
RNA/LNP encapsulated mRNA	BioNTech/Fosun Pharma/Pfizer	2	0, 28	IM	√
RNA/CVnCoV Vaccine	CureVac AG	2	0, 28	IM	x
Protein subunit/SARS CoV-2 rS – Matrix M1 adjuvant	Novavax	2	0, 21	IM	√
Protein subunit/ recombinant SARS CoV-2 vaccine (CHO cells)	Anhui Zhifei Longcom Biopharmaceutica, Chinese Academy of Sciences	3	0, 28, 56	IM	√

TID COVID-19 Guidance Focused Review: SARS-CoV-2 Vaccine in Transplant Recipients. Updated 5 January 2021. https://tts.org

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