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New vaccines update: 2024 pipeline outlook

9:50 am

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Search Methodology and Summary

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1. TGA search under 'Prescription Medicines Under Evaluation'
https://www.tga.gov.au/resources/prescription-medicines-under-evaluation?keywords=pfizer

2. Approached vaccine companies in Australia, requesting topline details on any new vaccine products/new indications with an expected TGA approval up until 2025.

Summary

- Pfizer [3 new vaccine products/new clinical indications]
- Moderna [2 new vaccine products/new clinical indication]
- Biocelect [2 new vaccine products]
- GSK [1 new vaccine product]
- Sanofi [1 new vaccine product/new clinical indication]
- AZ [advised no new vaccines/new indications for existing vaccines]
- MSD [advised they are unable to disclose pending registrations]
- Seqirus [advised they are unable to disclose pending registrations]

Vaxchora - Cholera vaccine

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Product	Vaccine type	Approved therapeutic indication	Approvals
Vaxchora®* *Biocelect*	Live attenuated cholera bacteria (*V. cholerae* O1 classical Inaba strain CVD 103-HgR).	For active immunisation against disease caused by *V.cholerae* serogroup O1 in adults and children aged ≧2 years travelling to cholera-affected countries.	• FDA Jun 2016 • EMA Apr 2020 • TGA Sept 2023

Human challenge study (enrolled 197 volunteers aged 18-45 yrs) in which a subset of VAXCHORA vaccine or placebo recipients were challenged with live V. cholerae at 10 days post-vaccination (n=68) or 3 months post-vaccination (n=66).

- ***Vaccine efficacy:*** 90.3% against moderate or severe diarrhoea in the 10-day challenge group (n=35)

  79.5% against moderate or severe diarrhoea in the 3-month challenge group (n=33).

- ***Vaccine safety:*** Vaxchora was as well tolerated as placebo, with only diarrhoea been more common in vaccine recipients compared to placebo recipients.

*single oral dose, should be administered at least 10 days prior to potential exposure to cholera.

https://www.tga.gov.au/resources/artg/389746

Approaching RSV vaccines

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Product	Vaccine type	Target Group	Approvals
Arexvy® *GSK*	Pre-fusion F protein adjuvanted (AS01E) subunit RSV vaccine	Older adults (≥60y)	• FDA - May 23 • EMA - Jun 23 • TGA - under evaluation, accepted Jan 2023
Abrysvo® *Pfizer*	Bivalent pre-fusion F protein RSV vaccine	Older adults (≥60y) **Pregnant women (to protect infants)*	• FDA - May 23 • EMA - Jul 23 • TGA - under evaluation, accepted May 2023
mRNA-1345 *Moderna*	m-RNA for RSV pre-fusion F protein	Older adults (≥60y)	• FDA - under review (fast track designation) • EMA - under review • TGA - under review, accepted Jul 2023 (priority pathway)

**Approval granted by the EMA only*

Footnotes: FDA – Federal Drug Agency (FDA); EMA (European Medicines Agency (EMA), Medicines; Medicines and Healthcare products Regulatory Agency (MHRA); Therapeutic Goods Agency (TGA).

I would first like to acknowledge Dr Gemma Saravanos for willingly providing me with copy of a couple of her slides from a recent RSV update presentation 23 Aug 2023

Approaching RSV vaccines

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Product	Vaccine type	Proposed therapeutic indication
Arexvy®* *GSK*	Pre-fusion F protein adjuvanted (AS01E) subunit RSV vaccine	For the prevention of lower respiratory tract disease (LRTD) caused by RSV in older adults (≧ 60yrs of age).

Phase 3 RCT, placebo (saline)-controlled (17 countries^, 24,973 immunocompetent participants ≥60y enrolled)

- ***Vaccine efficacy:*** 82% (95% CI 58-94%) for RSV-associated LRTD in 1st season

  75% (95% CI 60-85%) for RSV-associated LRTD over 2 seasons

- ***Vaccine safety:*** Serious adverse events (SAE) similar in the intervention & control group
  Higher reactogenicity (solicited local/systemic reactions) 3.8 to 0.9%

*Given as single dose, IM administration

^included countries located in both northern and southern hemispheres

Melbar et al. MMWR 2023 https://www.cdc.gov/mmwr/volumes/72/wr/pdfs/mm7229a4-H.pdf

Approaching RSV vaccines cont.

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Product	Type	Proposed therapeutic indication(s)
Abrysvo®* *Pfizer*	Bivalent pre-fusion F protein RSV vaccine	For the prevention of respiratory tract disease for persons aged ≧ 60yrs and pregnant women (to protect infants).

Phase 3 RCT, placebo (vaccine buffer)-controlled (7 countries^, 36,862 immunocompetent participants ≥60y enrolled)

- ***Vaccine efficacy:*** 89% (95% CI 54-99%) for RSV-associated LRTD in 1st season

  84% (95% CI 60-95%) for RSV-associated LRTD over 2 seasons

- ***Vaccine safety:*** Serious adverse events (SAE) similar in the intervention & control group
  Slightly higher reactogenicity (solicited local/systemic reactions) 1.0% to 0.7%

*Given as single dose, IM administration

^included countries located in both northern and southern hemispheres

Melbar et al. MMWR 2023 https://www.cdc.gov/mmwr/volumes/72/wr/pdfs/mm7229a4-H.pdf

Approaching RSV vaccines cont.

Product	Type	Proposed therapeutic indication(s)
Abrysvo®* *Pfizer* **EMA only*	Bivalent pre-fusion F protein RSV vaccine	Maternal immunisation (to protect newborns and infants against severe RSV disease in the first 6 months after birth).

Phase 3 RCT placebo (vaccine buffer)-controlled (18 countries, 7,392 pregnant women enrolled)

- ***Vaccine efficacy:*** 81.8% (99.5% CI 40.6-96.3%) in babies against medically attended severe RSV-associated LRTI within 90 days after birth

  69% (97.6% CI, 44 to 84) in babies against severe LRTI within 180 days after birth.

- ***Vaccine safety:*** Serious adverse events (SAE) similar in the intervention & control group
  Reactogenicity – injection site pain, muscle pain & headache more common in the intervention group. No safety signals

*Given as single dose to pregnant women between 32 - 36 weeks gestation, IM administration

Kampmann et al. NEJM 2023 https://doi.org/10.1056/NEJMoa2216480

Approaching RSV vaccines cont.

Product	Type	Proposed therapeutic indication
mRNA-1345* *Moderna*	mRNA for RSV pre fusion F protein (nucleic acid)	For the prevention of lower respiratory tract disease (LRTD) and acute respiratory disease (ARD) caused by RSV in adults aged 60 years or older.

Phase 3 RCT ConquerRSV study ongoing (22 countries, ~37,000 participants ≥60y enrolled participants)

- ***Vaccine efficacy:*** 83.7% (95% CI 66-92%) for RSV-associated LRTD as defined by two or more symptoms
  82.4% (96.36% CI: 34.8%, 95.3%; p=0.0078) against RSV-LRTD defined by three or more symptoms.

- ***Vaccine safety:*** Reported to be well tolerated with a favourable safety profile. Solicited adverse reactions were mild or moderate and included injection site pain, fatigue, headache, myalgia, and arthralgia

*Given as single dose, IM administration

https://www.tga.gov.au/resources/prescription-medicines-under-evaluation/tbc-moderna-australia-pty-ltd

https://investors.modernatx.com/news/news-details/2023/Moderna-Announces-Global-Regulatory-Submissions-For-Its-Respiratory-Syncytial-Virus-RSV-Vaccine-MRNA-1345/default.aspx

Approaching RSV preventatives

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Product	Type	Target Group	Approvals
Beyfortus®* *(nirsevimab)* *Sanofi-Aventis*	Long-acting mAb – passive immunisation	Infants and young children (<24m) at high risk of severe RSV disease	• FDA Jul 23 • EMA Oct 22 • MHRA Nov 22 • TGA – under evaluation, accepted Nov 2022

In infants younger than age 8 months who were born during or entering their first RSV season, efficacy was evaluated through 150 days after injection:

- ***Pooled efficacy from Ph 2 & Ph 3 studies:*** 79.0% (95% CI 69-86%) for medically attended RSV-LRTI
  80.6% (95% CI 68-92%) for RSV-LRTI hospitalization
  90.0% (95% CI 16.-99%) for RSV-LRTI ICU admissions

- ***Safety:*** Serious adverse events higher than placebo (29 to 25%) but not significant.
  Common & expected adverse events similar e.g. injection site reaction, rash

*Given as single dose (varies by weight/age) to infants born shortly before or are entering their 1st RSV season; IM administration

https://www.cdc.gov/vaccines/acip/meetings/slides-2023-08-3.html; https://www.clinicaltrials.gov/study/NCT05437510/

Approaching MenABCW$_{135}$Y vaccine

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Product	Type	Target Group	Submission dates
Penbraya®* *Pfizer*	Pentavalent Men ABCWY vaccine – constituted from monovalent Men B (Trumenba®) and Men ACWY (Nimenrix®)	10-25 yos	• FDA – submitted Dec 2022 • TGA – submitted May 2023

Phase 3 RCT (5 countries incl USA, enrolled 2431 participants aged 10-25 yrs)

- ***Vaccine efficacy:*** MenABCWY met the primary endpoint achieving noninferiority for all 5 serogroups (serogroups A, B, C, W and Y) compared with 2 doses of MenB (Trumenba®) and 1 dose of MenACWY (Menveo®).

  Noninferiority was also demonstrated for serogroups A, C, W and Y with a single dose of MenABCWY compared with 1 dose of Menveo® (secondary endpoint).

- ***Vaccine safety:*** Acceptable safety profile non-inferior to Trumenba® + Menveo® for all serogroups

*Given as a 2-dose vaccine schedule, 6 months apart. IM administration

Approaching Chikungunya vaccine

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Product	Vaccine type	Proposed therapeutic indication	TGA submission date
CHIKV VLP (PXVX0317) ®* *Biocelect*	Virus-like particle (VLP)-based adjuvanted chikungunya virus vaccine candidate	For active immunisation against chikungunya disease for persons aged from 12 years.	• TGA – planned for 2024

- ***Vaccine immunogenicity/ seroprotection:*** CHIKV VLP induced chikungunya neutralising antibodies in 98% of vaccinees 22 days after a single vaccination – residing in non-endemic country. The strong neutralising antibody titres were equal to, or exceeded the threshold agreed with authorities as a marker of seroprotection, meeting primary objectives of the study. 86% of the subjects had seroprotective levels of neutralising antibodies 6 months post vaccination.

- ***Vaccine safety:*** CHIKV VLP was well-tolerated in this healthy adolescent and adult population and adverse events were mainly mild or moderate in nature.

*Given as a single dose. IM administration

Extension of age indication

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Product	Vaccine type	Proposed new age indication	TGA submission date
Prevenar 20® *Pfizer*	PCV20 incl 13PCV serotypes + 8, 10A, 11A, 12F, 15B, 22F and 33F	For the prevention of pneumococcal disease in paediatric populations (individuals aged 6 weeks and above)*.	• TGA – Jan 2023

- ***Vaccine efficacy:*** Licensure was compared to PCV13 and based on 1) non-inferiority of GMCs post toddler dose; 2) % participants with at least 0.35mcg/ml for each serotype. Noninferiority was met for 14/20 serotypes.

  PCV13 is more immunogenic than PCV20, BUT you are now protecting against 20 serotypes rather than 13 serotypes. Designed to cover the additional 7 serotypes that occur in invasive disease in adults.

*In infants, given as a 4-dose vaccine schedule, 2, 4, 6 and 12-15 months of age. IM administration

Prevenar 20 is currently registered for use in adults 18 years of age and older (see Australian PI, PREVENAR 20 (tga.gov.au)).

Strain update for two COVID-19 vaccines

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Product	Vaccine type	Proposed therapeutic indication	TGA submission date
Comirnaty® *Pfizer*	Monovalent formulation with an Omicron-specific spike protein (XBB 1.5)	A booster dose for active immunisation to prevent COVID-19 caused by SARS-CoV-2 for individuals aged 12yrs+, irrespective of previous COVID-19 vaccinations	• TGA – under evaluation, accepted Jul 2023
mRNA-1273.815 (Spikevax®) *Moderna*	Monovalent formulation with an Omicron-specific spike protein (XBB 1.5)	A booster dose for active immunisation to prevent COVID-19 caused by SARS-CoV-2 for individuals aged 6 months and older.	• TGA – under review, accepted Jul 2023

Change in dosing for rabies pre-exposure prophylaxis vaccination recommendation

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Product	Vaccine type	New dosing recommendation	Approval date
Verorab® *Sanofi*	Inactivated rabies vaccine	Pre-exposure prophylaxis - reduced schedule to 2 doses (IM or ID), pre-exposure given at 0 and 7 days. No need for immunoglobulin post-exposure.* A 3rd dose (booster) given within 12 months of the initial 2 doses will provide longer term protection.	• TGA approval Oct 2022 • To take effect on release of revised Immunisation Handbook in late 2023.

*This regimen should not be used for immunocompromised individuals - (see Section 4.2.2.3.1)

https://www.ebs.tga.gov.au/ebs/picmi/picmirepository.nsf/pdf?OpenAgent&id=CP-2022-PI-02190-1&d=20231005172310101

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Thankyou ☺ ….any questions?