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Supporting Information

Supplementary methods

This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.

Appendix to: Best KP, Northcott C, Simmonds LA, et al. The early implementation phase of the Omega-3 Test-and-Treat Program for reducing the risk of preterm birth, South Australia, 2021–22: an implementation evaluation study. *Med J Aust* 2025; doi: 10.5694/mja2.70101.

Supplementary methods

Information brochures: SA Maternal Serum Antenatal Screening (SAMSAS) Program

1. Omega-3 screening to help prevent premature births: Information for families.

2. Omega-3 status test for prematurity risk: Information for health professionals.

SA Pathology and the South Australian Health and Medical Research Institute (SAHMRI) are evaluating omega-3 screening for pregnant women. Our aim is to reduce the number of babies born prematurely.

Further information

Visit **www.sahmri.org/omega3**
It includes information about supplements with different doses of omega-3

Speak to your doctor or midwife

Scan to find out more!

Evaluation of omega-3 screening program

It is important to assess how many women have low omega-3 levels and how many babies were born early since the omega-3 screening started. This will see if screening has reduced the number of premature births in South Australia. We will securely link the omega-3 test results with birth data, without identifying you or your baby in any way. You may decline to have your data linked without affecting you or your baby's care.

Opting out: If you do not want your data included in the statewide evaluation of omega-3 screening, please email omega3@sahmri.com or telephone (08) 8128 4444.

The evaluation has been approved by the Women's and Children's Health Network (WCHN) Human Research Ethics (HREC) Committee (HREC/20/WCHN/138). Should you wish to discuss the study with someone not directly involved, you may contact the executive secretary of the Human Research Ethics Committee, Mr Luke Fraser, WCHN (08) 8161 6521.

SA PATHOLOGY

If you would like further information about the evaluation of the omega-3 screening program contact us:

omega3@sahmri.com
(08) 8128 4444

Version 2.3 18/09/2023

Omega-3 screening to help prevent premature births

Information for **families**

SAHMRI
South Australian Health & Medical Research Institute

What is omega-3 and why is it important for your pregnancy?

Omega-3 fats are nutrients commonly found in fish and algae. Enough omega-3 in your body during pregnancy can help you have a full-term pregnancy. Babies born too soon (premature), particularly those born before 34 weeks of pregnancy, may have lengthy stays in hospital and may experience long-term health problems and delays in development.

Women expecting one baby who have low omega-3 levels in their blood are at higher risk of having their baby born prematurely. They are most likely to benefit from omega-3 supplements. Women who have sufficient omega-3 levels are already at lower risk of having a premature baby and do not need to take additional omega-3 supplements.

What is omega-3 screening?

Screening or measuring omega-3 levels in blood before 20 weeks of pregnancy identifies women who require omega-3 supplements. This project is evaluating how well an omega-3 screening program will work to reduce premature birth for women expecting one baby. There is not yet a screening test for women expecting twins or triplets.

How does the omega-3 screening test occur?

After discussing with you, your health professional will order your omega-3 screening test on the SA Maternal Serum Antenatal Screening (SAMSAS) request form. Your omega-3 level will be measured using the blood being collected for the SAMSAS program. The test is provided free to families.

Your omega-3 test results

Your health professional will receive your omega-3 test results and discuss these with you at your next appointment.

Omega-3 test result	Health professional advice based on your omega-3 test result
Less than 3.7% (low status)	Your health professional will recommend taking **omega-3 supplements** (fish oil or algal oil) to reduce your risk of a premature birth: • The suggested dose is 800 mg of DHA and 100 mg of EPA every day. • Omega-3 supplements you can take include: Infantem (Pharmamark)* and Omega Brain (Blackmores). • If you are vegetarian or vegan, you can take algal oil supplements. • You can take supplements from before 20 weeks up until 37 weeks of pregnancy. PLEASE NOTE: If you are already on prescription medication to stop your blood clotting (like Clexane), speak with your doctor before taking omega-3 supplements.
Between 3.7 and 4.3% (moderate status)	**You do not need to do anything different from what you usually do.** • If you are already taking omega-3 fatty acids as part of a multivitamin and mineral supplement, or an omega-3 supplement, you can keep taking these.
Above 4.3% (sufficient status)	**Omega-3 supplements are not needed** and provide no benefit to decreasing your risk of premature birth. • If you are already taking omega-3 fatty acids as part of a multivitamin and mineral supplement and wish to continue, the dose of DHA and EPA should not be more than 250 mg per day. Taking high doses of DHA and EPA (900 mg per day or more) may increase the risk of premature birth in women with sufficient omega-3 status.

*Vegan algal oil supplement of DHA and EPA.

Omega-3 status test for prematurity risk

SA Maternal Serum Antenatal Screening (SAMSAS) Program

Information for **health professionals**

Scan to find out more!

SAHMRI
South Australian Health & Medical Research Institute

Version 2.1 18/09/23

SA Pathology, through the SA Maternal Serum Antenatal Screening (SAMSAS) program, and the South Australian Health and Medical Research Institute (SAHMRI) are evaluating serum omega-3 testing for women with singleton pregnancies in South Australia from 2021.

Why do omega-3 status testing?

Women with a singleton pregnancy and low omega-3 status (concentration) in their blood are at higher risk of early preterm birth than women with adequate omega-3 status. Supplementing women who are low in omega-3 reduces their risk of early birth. Screening before 20 weeks' gestation will identify women who require omega-3 supplementation.

The latest National Health and Medical Research Council and Department of Health National Pregnancy Care guidelines recommend assessing omega-3 fatty acid status and supplementing pregnant women with low omega-3 intakes. The SA Pathology-SAHMRI project is evaluating the implementation of this omega-3 guideline recommendation.

There is high quality evidence for omega-3 status testing

- A Cochrane systematic review of 70 randomised controlled trials of almost 20,000 women with mainly singleton pregnancies indicated that omega-3 supplementation from early-mid pregnancy until birth reduces the risk of early preterm birth by 42% (from 46 per 1000 to 27 per 1000 births) and preterm birth by 11% (from 134 per 1000 to 119 per 1000 births)[1].

- The Cochrane review included many studies that were conducted before prenatal supplements with low dose omega-3, around 200 mg per day, were commonly taken by women[1]. Two later large randomised trials assessing omega-3 supplementation in contemporary practice in Australia and the USA suggest that universal supplementation of all women would not be effective, but reductions in early preterm birth are achieved by targeting women with low omega-3 status[2-4]. These women are at higher risk of early birth and more likely to benefit from supplementation[2-4].

1 Middleton P, Gomersall JC, Gould JF, Shepherd E, Olsen SF, Makrides M. Omega-3 fatty acid addition during pregnancy. Cochrane Database Syst Rev. 2018;11:CD003402.

2 Makrides M, Best K, Yelland L, McPhee A, Zhou SJ, Quinlivan J, et al. A randomized trial of prenatal omega-3 fatty acid supplementation and preterm delivery (ORIP trial). New England Journal of Medicine. 2019;381:1035-45. https://doi.org/10.1056/nejmoa1816832

3 Carlson SE, Gajewski BJ, Valentine CJ, Kerling EH, et al. Higher dose docosahexaenoic acid supplementation during pregnancy and early preterm birth: A randomised, double-blind, adaptive-design superiority trial. EClinicalMedicine. 2021;36:100905.

4 Simmonds LA, Sullivan TR, Skubisz M, Middleton PF, Best KP, Yelland LN, et al. Omega-3 fatty acid supplementation in pregnancy – baseline omega-3 status and early preterm birth: exploratory analysis of a randomised controlled trial (ORIP). BJOG. 2020;27(8):975-981. https://doi.org/10.1111/1471-0528.16168.

5 Percentage of total omega-3 fatty acid status in serum.

Omega-3 status test results: how to advise women

Omega-3 status[4,5]	Guidance to incorporate into pregnancy care plan
Less than 3.7% (low status)	**Take omega-3 fatty acid supplements** until 37 weeks, to reduce the risk of early preterm birth. Suggested dose: 800 mg DHA and 100 mg EPA per day. Typical suitable supplements include Infantem (Pharmamark)* and Omega Brain (Blackmores).
Between 3.7 and 4.3% (moderate status)	**No action required.** If already taking omega-3 fatty acids as part of a multivitamin and mineral supplement or a standalone supplement, this may continue.
Above 4.3% (sufficient status)	**Omega-3 supplements are not required** and provide no benefit to risk of early preterm birth. If women are already taking omega-3 fatty acids as part of a multivitamin and mineral supplement and wish to continue, the dose of DHA+EPA should not exceed 250 mg per day.

*Vegan algal oil supplement of DHA and EPA.

Potential risks with omega-3 fatty acid supplementation

- For women with sufficient omega-3 status (above 4.3%), higher dose omega-3 supplements (more than 900 mg per day) may increase their risk of early preterm birth.[4]
- Omega-3 fatty acid supplements should be avoided for women requiring Clexane because of possible additive anti-coagulant effects.
- Low dose aspirin can be taken with omega-3 fatty acid supplements. Recent randomised trials of omega-3 fatty acid interventions have included women on low dose aspirin without increase in adverse events.

Omega-3 blood sample and cost

No additional blood sample is required as omega-3 analysis will be performed on serum collected as a part of the established SAMSAS program. The omega-3 fatty acid analyses will be performed at no cost to women or the health service.

Evaluation of Omega-3 status testing program

This SA Pathology-SAHMRI collaboration will assess the feasibility and reach of identifying women with low omega-3 status, providing appropriate advice and ultimately assessing success in reducing the rates of early preterm birth. This will be done by deidentified linkage of the omega-3 status test results with relevant pregnancy outcome data. Women who do not want their data linked will need to contact (08) 8128 4444 or email omega3@sahmri.com. The evaluation has been approved by the Women's and Children's Health Network Human Research Ethics (HREC) Committee (HREC/20/WCHN/138). Should you wish to discuss the study with someone not directly involved, you may contact the executive secretary of the Human Research Ethics Committee, Mr Luke Fraser, WCHN (08) 8161 6521.

How to order the Omega-3 status test

1. Discuss the omega-3 status test and refer woman to the Information for Families brochure.
2. Order using the updated SAMSAS blood analysis request form.
3. Tick the omega-3 status test on the SAMSAS request form. Alternatively, superseded SAMSAS request forms can be used to order the omega-3 test. Write "omega-3 to SAMSAS" on the superseded SAMSAS request forms.
4. Refer the woman to the Privacy Disclosure on the SAMSAS request form.
5. The omega-3 status test results will be reported to the requesting provider as a standalone report and will be available on OACIS.

Further Information

For further information regarding omega-3 status testing, results interpretation and a list of supplements with different doses of omega-3:

Visit **sahmri.org/omega3**

Email **omega3@sahmri.com**

Call **0438 273 155**

For request forms:

Call the SAMSAS Program **(08) 8161 7285**

SA PATHOLOGY

Standards for Reporting Implementation Studies: the StaRI checklist for completion

Note: The page numbers in this checklist refer to the submitted manuscript, not to the published article or its Supporting Information file

The primary focus of implementation science is the implementation strategy (column 1) and the expectation is that this will always be completed.	The evidence about the impact of the intervention on the targeted population should always be considered (column 2) and either health outcomes reported or robust evidence cited to support a known beneficial effect of the intervention on the health of individuals or populations.

The StaRI standards refers to the broad range of study designs employed in implementation science. Authors should refer to other reporting standards for advice on reporting specific methodological features. Conversely, whilst all items are worthy of consideration, not all items will be applicable to, or feasible within every study.

Checklist item		Reported on page #	Implementation Strategy	Reported on page #	Intervention
			"Implementation strategy" refers to how the intervention was implemented		"Intervention" refers to the healthcare or public health intervention that is being implemented.
Title and abstract					
Title	**1**	1	Identification as an implementation study, and description of the methodology in the title and/or keywords		
Abstract	**2**	1	Identification as an implementation study, including a description of the implementation strategy to be tested, the evidence-based intervention being implemented, and defining the key implementation and health outcomes.		
Introduction					
Introduction	**3**	2	Description of the problem, challenge or deficiency in healthcare or public health that the intervention being implemented aims to address.		
Rationale	**4**	2	The scientific background and rationale for the implementation strategy (including any underpinning theory/framework/model, how it is expected to achieve its effects and any pilot work).	5	The scientific background and rationale for the intervention being implemented (including evidence about its effectiveness and how it is expected to achieve its effects).
Aims and objectives	**5**	3	The aims of the study, differentiating between implementation objectives and any intervention objectives.		
Methods: description					
Design	**6**	5	The design and key features of the evaluation, (cross referencing to any appropriate methodology reporting standards) and any changes to study protocol, with reasons		
Context	**7**	5-9	The context in which the intervention was implemented. (Consider social, economic, policy, healthcare, organisational barriers and facilitators that might influence implementation elsewhere).		
Targeted 'sites'	**8**	5-9	The characteristics of the targeted 'site(s)' (e.g locations/personnel/resources etc.) for implementation and	6	The population targeted by the intervention and any eligibility criteria.

			any eligibility criteria.		
Description	**9**	8 & Table 1	A description of the implementation strategy	6	A description of the intervention
Sub-groups	**10**	N/A	Any sub-groups recruited for additional research tasks, and/or nested studies are described		
Methods: evaluation					
Outcomes	**11**	8-9	Defined pre-specified primary and other outcome(s) of the implementation strategy, and how they were assessed. Document any pre-determined targets	N/A	Defined pre-specified primary and other outcome(s) of the intervention (if assessed), and how they were assessed. Document any pre-determined targets
Process evaluation	**12**	10-11	Process evaluation objectives and outcomes related to the mechanism by which the strategy is expected to work		
Economic evaluation	**13**	N/A	Methods for resource use, costs, economic outcomes and analysis for the implementation strategy	N/A	Methods for resource use, costs, economic outcomes and analysis for the intervention
Sample size	**14**	N/A	Rationale for sample sizes (including sample size calculations, budgetary constraints, practical considerations, data saturation, as appropriate)		
Analysis	**15**	8-9	Methods of analysis (with reasons for that choice)		
Sub-group analyses	**16**	N/A	Any a priori sub-group analyses (e.g. between different sites in a multicentre study, different clinical or demographic populations), and sub-groups recruited to specific nested research tasks		
Results					
Characteristics	**17**	10	Proportion recruited and characteristics of the recipient population for the implementation strategy	10	Proportion recruited and characteristics (if appropriate) of the recipient population for the intervention
Outcomes	**18**	10	Primary and other outcome(s) of the implementation strategy	N/A	Primary and other outcome(s) of the Intervention (if assessed)
Process outcomes	**19**	10-11	Process data related to the implementation strategy mapped to the mechanism by which the strategy is expected to work		
Economic evaluation	**20**	N/A	Resource use, costs, economic outcomes and analysis for the implementation strategy		Resource use, costs, economic outcomes and analysis for the intervention
Sub-group analyses	**21**	N/A	Representativeness and outcomes of subgroups including those recruited to specific research tasks		
Fidelity/ adaptation	**22**	10	Fidelity to implementation strategy as planned and adaptation to suit context and preferences	10-11	Fidelity to delivering the core components of intervention (where measured)
Contextual changes	**23**	N/A	Contextual changes (if any) which may have affected outcomes		

Harms	**24**	N/A	All important harms or unintended effects in each group		
Discussion					
Structured discussion	**25**	12-14	Summary of findings, strengths and limitations, comparisons with other studies, conclusions and implications		
Implications	**26**	14	Discussion of policy, practice and/or research implications of the implementation strategy (specifically including scalability)	14	Discussion of policy, practice and/or research implications of the intervention (specifically including sustainability)
General					
Statements	**27**	5	Include statement(s) on regulatory approvals (including, as appropriate, ethical approval, confidential use of routine data, governance approval), trial/study registration (availability of protocol), funding and conflicts of interest		

The StaRI standard should be referenced as: Pinnock H, Barwick M, Carpenter C, Eldridge S, Grandes G, Griffiths CJ, Rycroft-Malone J, Meissner P, Murray E, Patel A, Sheikh A, Taylor SJC for the StaRI Group. Standards for Reporting Implementation Studies (StaRI) statement. *BMJ* 2017;356:i6795

The detailed Explanation and Elaboration document, which provides the rationale and exemplar text for all these items is: Pinnock H, Barwick M, Carpenter C, Eldridge S, Grandes G, Griffiths C, Rycroft-Malone J, Meissner P, Murray E, Patel A, Sheikh A, Taylor S, for the StaRI group. Standards for Reporting Implementation Studies (StaRI). Explanation and Elaboration document. *BMJ Open* 2017 2017;7:e013318

Notes: A key concept of the StaRI standards is the dual strands of describing, on the one hand, the implementation strategy and, on the other, the clinical, healthcare, or public health intervention that is being implemented. These strands are represented as two columns in the checklist.