<table>
<tr><td>Alert</td><td>Ensure infant is tolerating at least 120 ml/kg/day of enteral feeds before the commencement.
Doctors should prescribe Beneprotein on Medication chart and fluid chart.</td></tr>
<tr><td>Indication</td><td>Protein fortification to prevent/treat growth failure</td></tr>
<tr><td>Action</td><td>Whey protein to improve growth.</td></tr>
<tr><td>Drug Type</td><td>Protein fortifier. 100% Whey protein. PDCAAS (Protein Digestibility Corrected Amino Acid Score): 100. Osmolality: 44 mOsm/kg water.</td></tr>
<tr><td>Trade Name</td><td>Beneprotein</td></tr>
<tr><td>Presentation</td><td>Beneprotein canister (Tin) – 224 g per canister
Beneprotein packets – 7 g per sachet/packet (not available in Australia as of October 2016)
1 g of beneprotein = 0.85 g of protein</td></tr>
<tr><td>Dosage / Interval</td><td>Refer to the guide for detailed prescription and administration of beneprotein in Appendix.
Ensure infant is tolerating at least 120 ml/kg/day of enteral feed volume.
Commence at 0.5 g/kg/day and titrate the dose according to once or twice weekly blood urea nitrogen levels as per table below:

<table>
<tr><td>Blood Urea</td><td>Beneprotein</td></tr>
<tr><td><3.2 mmol/L</td><td>Increase by 0.5 g/kg/day</td></tr>
<tr><td>3.2 – 5 mmol/L</td><td>Continue same</td></tr>
<tr><td>5 – 7.1 mmol/L</td><td>Reduce by 0.5 g/kg/day</td></tr>
<tr><td>>7.1 mmol/L</td><td>Stop supplement and repeat BUN a week later</td></tr>
</table>

<table>
<tr><td>Teaspoon measure</td><td>Grams of Beneprotein</td></tr>
<tr><td>1/8</td><td>0.3</td></tr>
<tr><td>1/4</td><td>0.6</td></tr>
<tr><td>1/2</td><td>0.9</td></tr>
<tr><td>3/4</td><td>1.4</td></tr>
<tr><td>1</td><td>1.6</td></tr>
</table>
</td></tr>
<tr><td>Maximum daily dose</td><td>Not applicable</td></tr>
<tr><td>Route</td><td>Oral.</td></tr>
<tr><td>Preparation/Dilution</td><td>Add the prescribed amount of Beneprotein to 12 hour volume of milk
(human milk/term formula/elemental formula) and administer as per fluid order.</td></tr>
<tr><td>Administration</td><td>Mixed with feeds.</td></tr>
<tr><td>Monitoring</td><td>Daily protein intake.
Blood urea levels once or twice weekly</td></tr>
<tr><td>Contraindications</td><td>unknown</td></tr>
<tr><td>Precautions</td><td>Renal failure. Contains milk and soy.</td></tr>
<tr><td>Drug Interactions</td><td>Not applicable</td></tr>
<tr><td>Adverse Reactions</td><td>Feed intolerance.
Protein overload.</td></tr>
<tr><td>Compatibility</td><td>No information.</td></tr>
<tr><td>Incompatibility</td><td>No information.</td></tr>
<tr><td>Stability</td><td>No information.</td></tr>
<tr><td>Storage</td><td>Dry powder at room temperature (20-25^{0}C).</td></tr>
<tr><td>Special Comments</td><td>South Eastern Sydney Local Health District (SESLHD) has a policy on charting of Oral Nutrition Support on medication charts.[7]</td></tr>
<tr><td>Evidence summary</td><td>The enteral nutritional goal is to reach daily protein and energy intakes of 3.6–4.5 g/kg and 110–135 kcal/kg, respectively. Recommended enteral protein requirements are as follows: Bodyweight <1 kg – 4-4.5 g/kg/day or 3.6-4.1 g/100 kcal; bodyweight 1-1.8 kg – 3.5-4.0 g/kg/day or 3.2-3.6 g/100 kcal.[1,2]</td></tr>
</table>

	Protein content is variable in human milk with a significant decline from transitional milk to mature milk [(1.9 g/100 ml (2.8 g/100 kcal) in preterm transitional 6-10 days milk; 1.5 g/100 ml (2.2 g/100 kcal) in preterm mature 22-30 days; 1.2 g/100 ml (1.9 g/100 kcal) in term mature ≥30 days).[9] The average protein content of human milk is 1.1 g/100 ml (1.7 g/100 kcal). The commercial fortifiers raise the protein level from the assumed 2.1–2.4 g/100 kcal only to about 3.25 g/100 kcal. The commercial fortifiers provide an **additional** protein between 1.2-1.6 g/100 ml depending on the brand [e.g. Nutricia BMF Fortifier 1.2 g/100 ml (1.8 g/100 kcal) and PreNAN HMF 1.6 g/100 ml (2.4 g/100 kcal)]. When preterm infants achieve clinically stable conditions and are enterally nourished, blood urea nitrogen may represent a useful index in monitoring the adequacy of protein intake.[3] Blood urea levels of <1.6 mmol/L suggest a protein intake of <3 g/kg/day.[4] Alan et al[5] assessed the effect of human milk (HM) fortification with extra protein supplement by an adjustable protein fortification method according to the weekly blood urea nitrogen (BUN) levels on growth in hospitalized preterm infants. In this prospective observational intervention study of preterm infants born <32 weeks gestation and fed with breast milk, control group were given a commercial HM fortifier which provides an additional protein of 0.8 g/3 scales whereas intervention group were given extra protein in addition to the HM fortifier with another commercial protein supplement (Protifar, Nutricia) which provides an additional protein of 2.2 g/1 scale. Additional protein supplementation was adjusted according to BUN levels weekly in the intervention group. Adjustments were based on BUN levels as suggested by Arslanoglu et al.[6] in the original "adjustable protein fortification regimen" with some modifications. If the BUN level was <3.2 mmol/L (9 mg/dl), protein was increased by 0.55 g. If the BUN level was between 5 and 7.1 mmol/L (14 and 20 mg/dl), protein was decreased by 0.55 g (1/4 scale). If the BUN level was > 7.1 mmol/L (>20 mg/dl), extra protein supplementation was stopped for a week. The median amount of daily enteral protein intake [4 (3.4.4.6) vs. 2.78 (2.1.3.1) g/kg/day, p b 0.0001] was significantly higher in the interventional group. Length (p = 0.008) and HC (p b 0.0001) gain velocities were significantly higher in the intervention group. Daily growth indexes for weight (2.2% vs. 1.8%, p = 0.026), for length (0.4% vs. 0.3%, p = 0.027) and for HC (0.48% vs. 0.36% per day, p = 0.003) were significantly higher in the intervention group. Beneprotein is 100% whey protein isolate. It's PDCAAS (Protein Digestibility Corrected Amino Acid Score): 100. Osmolality (mOsm/kg water): 44.
References	1. American Academy of Pediatrics. Nutritional needs of the preterm infant. In: Pediatric Nutrition Handbook, 7th ed, Kleinman RE, Greer FR (Eds), American Academy of Pediatrics, Elk Grove Village 2014. 2. Agostoni C, Buonocore G, Carnielli VP, et al. Enteral nutrient supply for preterm infants: commentary from the European Society of Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition. J Pediatr Gastroenterol Nutr 2010;50:85–91. 3. Roggero P, Giannì ML, Morlacchi L, Piemontese P, Liotto N, Taroni F, Mosca F. Blood urea nitrogen concentrations in low-birth-weight preterm infants during parenteral and enteral nutrition. J Pediatr Gastroenterol Nutr. 2010 Aug;51(2):213-5. doi: 10.1097/MPG.0b013e3181cd270f. 4. Polberger SK, Axelsson IE, Raiha NC. Urinary and serum urea as indicators of protein metabolism in very low birthweight infants fed varying human milk protein intakes. Acta Paediatr Scand 1990;79:737–42. 5. Alan S, Atasay B, Cakir U, Yildiz D, Kilic A, Kahvecioglu D, Erdeve O, Arsan S. An intention to achieve better postnatal in-hospital-growth for preterm infants: adjustable protein fortification of human milk. Early Hum Dev. 2013 Dec;89(12):1017-23. doi: 10.1016/j.earlhumdev.2013.08.015. Epub 2013 Sep 12. 6. Arslanoglu S, Moro GE, Ziegler EE. Adjustable fortification of human milk fed to preterm infants: does it make a difference? J Perinatol 2006;26(10):614–21. 7. http://www.seslhd.health.nsw.gov.au/Policies_Procedures_Guidelines/Clinical/Medicine/documents/SESLHDPR317MedicationChartsChartingof

	OralNutritionSupport.pdf 8. Beneprotein. Nestle Health Science Product Info. Accessed on October 6, 2016. 9. Tsang RC, Uauy R, Koletzko B, Zlotkin SH. Nutrition of the preterm infant. Scientific basis and practical guidelines. Second edition. P 336.

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Approval by: As per Local policy	**Approval Date:**

Appendix

Guide for prescribing Beneprotein

The amount of Beneprotein to be mixed with EBM/Aptamil is very small, therefore:

1. Calculate 12 hour amount of feed

   Example: weight: 800gr, TFR: 150mL/kg/day = 12 hour volume = 60mL)

2. Commence Beneprotein at 0.5g.kg/day. Choose the closest possible amount from the table below

   Example: 800 gr infant requiring 0.5 g/kg/day = 0.4 g. Closest possible amount is 0.3g = 1/8th tea spoon).

Teaspoon measure supplied	Beneprotein
1/8	0.3g
1/4	0.6g
1/2	0.9g
3/4	1.4g
1	1.6g

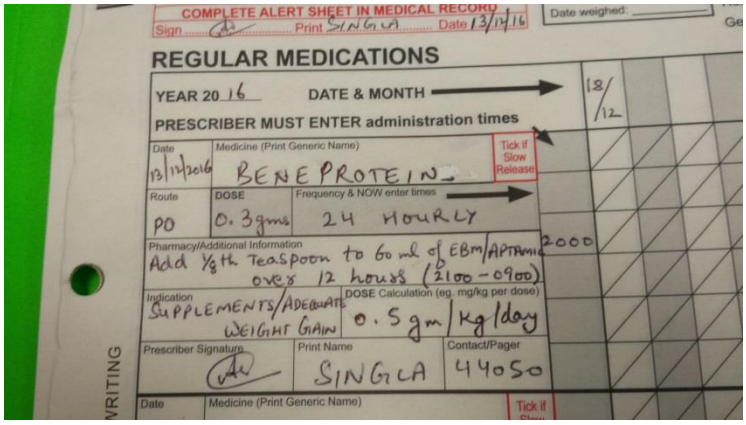
   NOTE: ¼ + ¼ ≠ ½

3. Determine the Beneprotein dose based on urea level– Refer to table in the dosage section. Choose the closest possible amount from the table above.

4. Prescribe daily Beneprotein dose on medication chart to commence at night.

   a. Example: At 20:00 pm→ 0.3g (add 1/8 teaspoon to 60mL EBM/Aptamil

   b. Signed by two nursing staff when feed made up for 12 hours with the total daily requirement of protein **PREFERABLY** at night



5. Chart fluid order on fluid chart

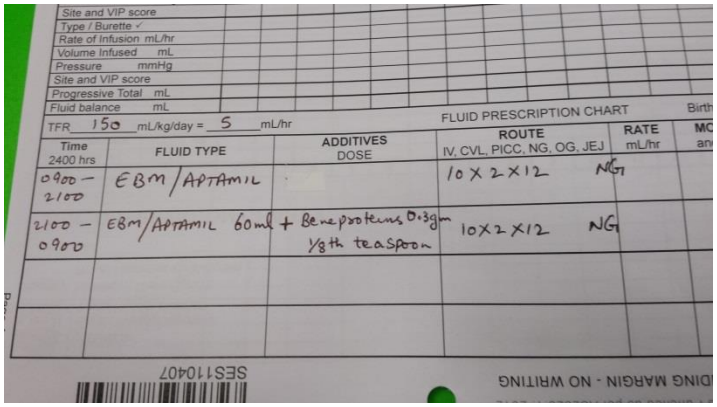
    a. Day time

        i. Example: 0900-2100→10 X 2 X 12 EBM/Aptamil

    b. Night time

        i. Example: 2100-0900→ 10X2X12 EBM/Aptamil+Beneprotein

        Add 0.3g=1/2 teaspoon Beneprotein in 60mL EBM/Aptamil



The protein supplement will be given during the night; therefore no supplemental protein will be missed during daytime breastfeeding.