Summary of clinical practice guidelines on nutrition support in ICU

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ESPEN Recommendation No.	ESPEN 2018	Evidence Grade	Consensus %	ASPEN 2016	Canadian Practice Guidelines 2015
1. Who needs medical nutrition therapy (MNT)?	Consider MNT for all patients staying in the ICU, mainly for >48hrs *In text: while waiting on a validated screen tool consider the following to be at risk patients:* - *ICU stay >2 days* - *Ventilated patients* - *Patients with infection* - *Patients underfed for >5days* - *Patients with severe chronic disease*	GPP	100	A1. Assess nutrition risk using NRS 2002 or NUTRIC *Expert consensus* C1. Patients at low nutrition risk and normal baseline nutrition status and low disease severity (NRS-2002 </= 3 or NUTRIC </=5) who cannot maintain volitional intake do not require specialised nutrition therapy in 1st week of ICU *Expert consensus*	Not addressed
2. How to assess malnutrition?	General clinical assessment to assess malnutrition until a tool is validated. Include: - previous history - unintentional weight loss - decrease in physical performance status pre-ICU - physical exam - assessment of body composition - muscle strength and mass if possible	GPP	100	A2. Include evaluation of comorbidities, GI function and aspiration risk. *Expert consensus*	
Statement 1: How to screen for risk of malnutrition or need for nutrition support	Consider all ICU pts in >48hrs at risk of malnutrition		96	A1. See above	
3. When should MNT start and by which route?	If able to eat (adequately) use PO diet ahead of EN, PN See also EISCM 2012 guideline endorsed by ESPEN 2018:	GPP	100	B1. Start EN within 24-48hrs where volitional intake not possible. *Very low quality evidence*	

	-if oral diet is not possible, patients should be considered for EN within the first 48 hrs -EN should be initiated in the absence of contraindications -EN should be started slowly (10-20 ml/h) and progressed cautiously with monitoring of GI symptoms				
4. Nutrition route	If PO diet not possible use early EN (within 48hrs) rather than delaying EN	B	100	B2. Use EN over PN *Low to very low quality evidence*	1 and 8. *Recommend* EN over PN when there is an intact GIT 8. Do not use early PN routinely but *consider* it in nutritionally high risk patients with a relative contraindication to EN (not appropriate in nutritionally low risk patients)
5	If PO diet not possible use early EN (within 48hrs) rather than early PN	A	100		
6	If PO/EN contra-indicated start PN within 3-7 days	B	89	G1. In low nutrition risk patients (NRS </=3 or NUTRIC </= 5) withhold exclusive PN for 1st 7 days following ICU admission if volitional intake/EN not feasible. *V low quality evidence*	10.1. In patients who are not malnourished, are tolerating some EN, or when PN is indicated < 10 days, *consider* low dose PN. *Insufficient data* to make recommendation about use of low dose PN in the following: those requiring PN for > 10 days; obese critically ill and malnourished critically ill. Weigh safety/benefits of low dose PN on a case-by-case basis in these patients.
7	In severely malnourished can use early and progressive PN if PO/EN contra-indicated	0	95	G2. In high nutrition risk (NRS>/=5 or NUTRIC >/=5) or severely malnourished patients if EN not feasible initiate exclusive PN asap. *Expert consensus*	
8	To avoid overfeeding don't use early EN and PN, but can use within 3-7 days	A	100		7.1. *Recommend* not starting EN and PN at same time. *Insufficient data* to recommend time at which PN should commence. Decision should be made on a case by case basis. All strategies to optimise EN delivery should be

					attempted prior to commencing PN.
9. Intermittent vs. continuous EN?	Use continuous rather than bolus EN	B	95	D4b. In high risk pts or pts with intolerance to bolus feeding use continuous feeding. *Expert Consensus*	6.3. *Insufficient data* to make a recommendation on continuous vs. any other method of EN administration
10. Post pyloric vs. gastric feeding?	Use gastric access as standard	GPP	100	B4b. Initiate EN in the stomach in most pts. *Expert consensus*	5.3. *Recommend* the use of small bowel feeding routinely in units where this is feasible, otherwise use it in patients at high risk of feed intolerance/regurgitation or aspiration. Where it is not feasible use in select pts with persistent GI intolerance
NG vs. gastrostomy					6.4. *Insufficient data*
11.	In gastric feeding intolerance not solved by prokinetics use postpyloric feeding	B	100	B4a &D4a. Divert level of feeding lower in GIT in pts at risk of aspiration or where GI intolerance has been shown. *Moderate to high quality evidence*	
12.	In those at high risk of aspiration can use postpyloric, mainly jejunal feeding	GPP	95	See above	
13. Do prokinetics improve outcome?	IV erythromycin should be used as 1st line prokinetic therapy	B	100	D4c. In patients at high risk of aspiration use prokinetics where clinically feasible. *Low quality evidence*	3.2. When commencing EN *consider* use of strategies to optimise feeding (starting at target, small bowel feeding, prokinetics, volume-based feeding, higher GRV threshold, concentrated feeds) 5.2. *Recommend* use of promotility agents when feed intolerance occurs. Use metoclopramide due to safety concerns regarding erythromycin. Insufficient data to recommend combined use of metoclopramide and erythromycin
14.	Alternatively can use IV metoclopramide or a combination of metoclopramide and erythromycin	0	100		
Gastric residual volumes/gastric	*In text:* GRV measurement is common and may help identify			D2a. Do not use GRV measurement. Where GRVs are used avoid holding EN	5.5a. *Consider* using a threshold of 250-500mls for GRVs and measuring them 4-

aspirate volumes (GRVs)	intolerance to EN during initiation and progression. May not be necessary when EN is established. Delay EN if GRV >500ml/6 hrs			if <500mls in absence of other signs of intolerance. *Low quality evidence*	8 hourly 5.5b. *Insufficient data* to make a recommendation on return of gastric aspirate
15. How to define energy expenditure (EE)?	In I+V patients use indirect calorimetry (IC) to calculate EE	B	95	A3a. Use IC. *Very low quality evidence*	3.1. *Insufficient data* to guide use of IC vs. predictive equations to determine energy requirements
	If IC not available use VCO2 from pulmonary artery catheter or ventilator over predictive equations (capnography)		82	A3b. Otherwise use published predictive equations or weight based **25-30kcal/kg** *Expert consensus*	
16. Target isocaloric or hypocaloric feeding?	If using IC can target progressive isocaloric rather than hypocaloric feeding after the early phase of acute illness. *In text*: If IC or VCO2 not available use of simple weight based equations (such as 20-25kcal/kg).	0	95	C2. Use either full or trophic feeding in ALI/ARDS pts. *High quality evidence*	3.3a. An initial strategy of trophic feeding for 5 days *should not be considered* in ALI patients. 3.3b. *Consider* intentional underfeeding of calories not protein in low nutritional risk but not higher risk patients.
17	Hypocaloric feeding <70% of EE should be administered in early phase of acute illness. ESPEN position paper 2018: Monitoring nutrition in the ICU: "an initial maximum energy target in the acute phase(usually limited to 3 days after ICU admission) should not exceed 20kcal/kg"	B	100	H2. In PN patients aim for <80% of energy requirements or </=20kcals/kg with adequate protein (1.2g/kg) in 1st week of ICU. *Low quality evidence*	
18	After day 3 if using IC can give 80-100% of measured EE	0	95		
19	If using predictive equations to estimate EE use hypocaloric feeding <70% of target for first week	B	95		
20. When should we start supplemental parenteral nutrition (SPN)?	If not tolerating full dose EN during 1st week of ICU, safety and benefit of initiating PN should be considered on a case by case basis	GPP	96	G3. Consider SPN after 7-10days in low or high nutrition risk patients if unable to meet >60% energy and protein requirements via EN.	7.1. *Recommend* not starting EN and PN at same time. Insufficient data to recommend time at which PN should commence. Decision should be made on

				Moderate quality evidence H7. Reduce PN as EN tolerance improves and stop PN if EN at >60% of target energy requirements. *Expert consensus*	a case by case basis. All strategies to optimise EN delivery should be attempted prior to commencing PN. 7.2. *Strongly recommend* not commencing PN and IV glucose. Insufficient data to recommend timing of SPN. Individualised decision as above. 10.1. In patients who are not malnourished, are tolerating some EN, or when PN is indicated for < 10 days, *consider* low dose PN. Insufficient data to make recommendation about use of low dose PN in the following pts: those requiring PN for > 10 days; obese critically ill and malnourished critically ill. Weigh safety/benefits of low dose PN on a case-by-case basis in these pts.
21.	Do not start PN until all strategies to maximise EN tolerance have been attempted	GPP	95		See above
22. Does high protein compared to low protein intake improve outcome?	Can give **1.3g/kg** protein progressively	0	91	A4. Evaluate adequacy of protein provision. *Expert consensus* C5. Provide **1.2-1.5g/kg** actual wt. Requirements may be higher in burns and multi-trauma. *Very low quality evidence*	4.2c. Insufficient evidence to recommend high protein diets or escalating doses of protein
Statement 3	Physical activity may improve beneficial effects of nutrition		86		
Hydoxyl Methyl Butyrate (HMB)					6.5 Insufficient data
23.What are optimal combinations of carbohydrate (CHO) and fat for EN and PN	**CHO <5mg/kg/min**	GPP	100	G3. Limit soy based IV fat emulsions to <100g/week in divided doses in 1st week of ICU *Very low quality evidence*	4.2a and b. Insufficient evidence to recommend high fat/low CHO or low fat/high CHO diets 9.2. Consider use of IV lipid that reduces

				Consider using alternative mixed fat emulsions. *Expert consensus* I1. Do not use high fat/low CHO formulations in ICU patients with acute respiratory failure (avoid overfeeding; avoid rapid infusion of IV fat emulsions especially soy based). *Very low quality evidence*	load of omega 6 fatty acids/soy bean oil. Insufficient data to make a specific recommendation on type of lipid 10.2. In patients who are not malnourished, are tolerating some EN, or when PN is indicated for < 10 days, *consider* withholding lipids high in soybean oil. Insufficient data to make a recommendation about withholding lipids high in soybean oil in pts who are malnourished or require PN for > 10 days.
24	IV lipid should be part of PN	GPP	100		See above
25.	Max 1.5g/kg **lipid**/day. Aim **1g/kg/day** and a blend of fatty acids	GPP	100		
26. Glutamine (GLN)?	If burns >20% BSA give additional enteral GLN 0.3-0.5g/kg/day for 10-15days	B	95		9.4a. *Recommend* IV GLN not be used in PN and EN 9.4b. *Recommend* high dose IV and enteral GLN in combination not be used 9.4c. *Strongly recommend* not using IV or enteral GLN
27	Trauma: can give enteral GLN 0.2-0.3g/kg/day for the 1st 5 days. If complicated wound healing can give for 10-15 days	0	91		
28	Do not give additional enteral GLN in critically ill patiens other than burns / trauma	B	92	F4. Do not routinely use supplemental enteral GLN. *Moderate quality evidence*	4.1c. *Recommend* enteral GLN not be used
29.	In unstable /complex ICU pts do not give IV GLN, especially in renal or liver failure	A	92	H6. Do not use IV GLN routinely. *Moderate quality evidence*	
Arginine	Not addressed			O3. Use immune modulating formula containing both fish oils and arginine. *Low to moderate quality evidence*	4. 1a. *Do not recommend* diets supplemented with arginine
IV Branch chain amino acids (BCAA)					9.1. *insufficient* data

Ornithine ketoglutarate (precursor for GLN and arginine)					*Insufficient evidence* to recommend
30. n-3s/omega 3s/ DHA and EPA/fish oils?	Enteral n-3s should not be given by bolus	B	91	O3. Use immune modulating formula containing both fish oils and arginine. *Low to moderate quality evidence*	4.1bii. *Insufficient* data to recommend use of fish oil supplements alone.
31.	N-3 enriched EN within nutritional doses (500mg/day) can be given	0	95		
32.	High dose n-3 enriched EN should not be given routinely	B	90	E3. Cannot make a recommendation on the routine use of an enteral feed characterised by an anti-inflammatory lipid profile (e.g. fish oils, borage oils i.e. Oxepa) and antioxidants in severe ARDS/ALI. *Very low to low quality evidence* O3. In post op major surgery pts use immune modulating formula containing both fish oils and arginine. *Low to moderate quality evidence*	4.1bi. *Consider* use of an enteral formula with fish oils, borage oils and antioxidants, i.e. Oxepa in ARDS/ALI.
33.	IV n-3 enriched lipid emulsions (fish oil dose 0.1-0.2g/kg/day) can be given to pts on PN	0	100		9.2. *Consider* use of IV lipid that reduces load of omega 6 fatty acids/soy bean oil. Insufficient data to make recommendation on type of lipid.
34. Micronutrients?	Provide trace elements and vitamins daily with PN	B	100	F3. Use a combination of antioxidants and trace elements reported to be safe. *Low quality evidence*	9.3. Insufficient data to make a recommendation on IV Zn supplementation. 11.1. *Do not use* supplemental combined vitamins and trace elements. 11.2. *Do not use* IV/PN Se supplementation, alone or in combination with other antioxidants 11.3. *Insufficient data* to make

					recommendation on Vit C supplementation 11.4. *Insufficient data* to make a recommendation for the use of Vit D.
35.	Do not use high dose antioxidant monotherapy without proven deficiency	B	96		
36. Vit D	If Vit D <50nmol/l you can supplement	GPP	86		11.4. *Insufficient data* to make a recommendation for the use of Vit D.
37.	If Vit D <50nmol/l can give high dose VitD3 500000 iu as a single dose within a wk after admission	0	86		
38. Contraindications to EN (as per Early Enteral Nutriton in Critically Ill Patients: EISCM clinical practice guidelines 2012)	EN should be delayed: If uncontrolled shock/tissue perfusion goals not met. Uncontrolled/life threatening hypoxemia, hypercapnia or acidosis (can be started in pts with stable hypoxemia, or compensated /permissive hypercapnia and acidosis. Active GI bleeding; but start EN when bleeding has stopped/no signs of re-bleeding. Overt bowel ischaemia. High output fistula if not able to do distal feeding. Abdominal compartment syndrome. GRV >500ml/6hr	B	100	B3. Overt signs of GI contractility not necessary to initiate EN in majority of patients. *Expert consensus* B5. Withhold EN in haemodynamic instability until patient is fully resuscitated or stable. Initiate /re-initiate EN with caution in patients undergoing withdrawal of vasopressor support. *Expert consensus*	1 and 8. *Recommend* EN over PN when there is an intact GIT 8. *Do not use* early PN routinely but consider it in nutritionally high risk patients with a relative contraindication to EN (not appropriate in nutritionally low risk patients)
39. Low dose EN	Give low dose EN in: Pts receiving therapeutic hypothermia, increase dose after re-warming. Intra-abdominal hypertension without abdominal compartment syndrome; consider stopping EN if intra-abdominal pressure values increase while feeding. Acute liver failure.	B	96		3.3a. An initial strategy of trophic feeding for 5 days *should not be considered* in ALI patients. 3.3b. *Consider* intentional underfeeding of calories not protein in low nutritional risk but not higher risk pts.
40. Early EN	Give early EN in:	B	96		2. *Recommend* starting EN within 24-

	ECMO Traumatic brain injury Stroke Spinal cord injury Severe acute pancreatitis GI surgery Abdominal aortic surgery Abdominal trauma where bowel continuity is confirmed/restored. Neuromuscular blocking agents (atracurium, rocuronium) Prone position therapy Open abdomen Absent bowel sounds unless bowel ischaemia or obstruction suspected.			48hrs in critically ill pts
41. Self ventilation (S/V) pts	S/V pts not meeting requirement via po diet – consider oral nutritional supplements (ONS) first then EN	GPP	96	
42. Dysphagia	In S/V pts with dysphagia considered texture modification. If unsafe to swallow use EN	GPP	94	
43.	In S/ V pts with dysphagia at very high risk of aspiration use postpyloric feeding. If this is not possible temporary PN with removal of feeding tube and swallow training can be used.	GPP	92	
44. EN in sepsis	Use early progressive EN in sepsis after haemodynamic stabilisation. If EN is contra-indicated use progressive PN/SPN	GPP	94	N1. Commence EN within 24-48hrs of sepsis/septic shock diagnosis as soon as resuscitation is complete and patient is haemodynamically stable. *Expert consensus* N2. Do not use exclusive PN or SPN with EN early in acute phase of severe sepsis/septic shock, regardless of pts degree of nutritional risk. *Very low quality evidence* N3. Cannot make a recommendation on

				Se, Zn and antioxidant supplementation in sepsis. *Moderate quality evidence* N4. Provide trophic feeding (10-20kcals/hr or up to 500kcals/day) for initial phase of sepsis, advancing as tolerated after 24-48hrs to >80% of target energy goal over the first wk. Deliver 1.2-2g/kg protein/d. *Expert consensus* N5. Do not use immune enhancing formulas routinely in severe sepsis. *Moderate quality evidence*
45. Abdo or oesophageal injury/surgery	In patients after abdominal/oesophageal injury can use early EN over delayed EN	0	96	M3a and b. Use early EN in patients with open abdomen in absence of bowel injury. Provide an extra 15-30g protein per litre of exudate. Provide energy as per other ICU pts. *Expert consensus* O1. Determine nutrition risk in all surgical ICU patients (NRS/NUTRIC). *Expert consensus* O2. Use EN within 24hrs of surgery when feasible. Associated with better outcomes than PN or standard care. *Very low quality evidence* O3. Use immune modulating formula containing both fish oils and arginine. *Low to moderate quality evidence* O4. Use EN on an individualised basis (consider safety) in difficult post op situations such as ileus, fresh intestinal anastomosis, open abdo, need for vasopressors.

				Very low to low quality evidence O5. For major upper GI Sx pts where EN is not feasible only commence PN if duration of therapy likely to be >7days. In low nutrition risk pts delay PN for 5-7days. *Expert consensus* O6. Pts can start solid diet when diet being advanced, clear liquids not necessary. *Expert consensus*
46.	In surgical complications after abdo/oesophageal surgery use EN over PN unless bowel discontinuity, GI obstruction or abdominal compartment syndrome	GPP	96	
47.	In unrepaired anastomotic leak, internal or external fistula enteral feeding access distal to the defect is the aim. Also in text: -for jejunostomy feeding use continuous administration and slow build-up of nutrition due to cases of bowel ischaemia. -Presence of anastomosis or re-anastomosis should not delay EN. -Often EN tolerance is impaired in complicated abdominal surgery pts - consider timely SPN to avoid prolonged nutritional deficits.	GPP	96	
48.	In unrepaired anastomotic leak, internal or external fistula where distal feeding not achieved withhold EN and use PN	GPP	100	
50. Trauma pts	Feed trauma pts EN in preference to PN	B	96	M1a. Use early EN with a high protein polymeric formula in immediate post trauma phase (within 24-48hrs of

	Also in text: can consider higher protein intakes e.g. 1.5-2g/kg/day due to large protein losses 20-30g/day			injury) once patient is haemodynamically stable. *Very low quality evidence* M1b. Consider EN formula with arginine and fish oils in pts with severe trauma. *Very low quality evidence*
51. Obese pts	Can give isocaloric nutrition, preferentially guided by IC and urinary nitrogen losses	0	89	Q1. Use early EN within 24-48hrs in obese patients who cannot sustain volitional intake. *Expert consensus* Q2 and 3. Evaluate biomarkers of metabolic syndrome (glucose, triglycerides, cholesterol) and level of inflammation (CRP, evidence of SIRS); central adiposity, metabolic syndrome, sarcopenia, BMI>40, SIRs… *Expert consensus* Q4 and 5. Implement hypokcal high protein feeding. Do not exceed 60-70% of target energy requirements measured by IC. If no IC use 11-14kcals/kg actual wt if BMI 30-50 and 22-25kcals/kg IBW if BMI >50. For protein give 2g/kg IBW for BMIs 30-40 and up to 2.5g/kg for BMI >40. *Expert consensus* Q6. IF available use a formula with low caloric density and high protein. *Expert consensus* Q7. Use additional monitoring for hyperglycaemia, hyperlipidaemia, hypercapnia, fluid overload and hepatic fat accumulation *Expert consensus*

				Q8. Pts with hx of bariatric surgery: give thiamine prior to nutrition /dextrose provision. Evaluate and treat micronutrient deficiencies. *Expert consensus*	
52.	If IC not available energy intake can be based on adjusted body weight (ABW) where ABW is IBW at BMI 25 plus 20-25% of difference between actual body wt and ideal body wt. This formula is not validated. If urinary nitrogen losses or lean body mass determination not available can give 1.3g/kg adjusted body weight. (Progressive increase as per other ICU pts) Note this ABW method above gives less kcals and protein than using actual body weight in PSU/modified PSU equation and less protein than 1.2g/kg actual wt. Consider pts activity level and age when making assumptions about lean vs. fat mass.	GPP	89	See above	
53. Monitoring glycaemia	Measure blood glucose initially after ICU admission or after artificial nutrition starts and then 4hrly for 1st 2 days (may need to do more frequently in unstable pts; blood draw central venous or arterial, avoid capillary pricks; use blood gas analyser or lab analyse not point of care devices; use IV and continuous insulin with an electric syringe; use a dynamic scale rather than a sliding scale; aim to avoid severe hyperglycaemia >10mmol/l, mild hypoglycaemia <3.9 mmol/l and high glucose variability;	GPP	93	H5. Keep blood glucose between 7.8 and 10mmol/l. *Moderate quality evidence*	10.4a. *Recommend* blood sugars > 10 mmol/L be avoided and to use a blood glucose target of around 8.0 mmol/L (or 7-9 mmol/L), rather than a more stringent or liberal target range. Insufficient data to recommend use of S/C insulin over IV.

	avoid large IV glucose infusions >3-4mg/kg/min)				
54.	If glucose >10mmol/l give insulin	A	93		10.4b. Insufficient data to recommend low CHO diets in conjunction with insulin
55. Electrolyte measurement	K+, PO4, Mg2+ should be measured at least daily for the first week	GPP	92		
56. Refeeding hypophosphataemia	In pts with PO4 <0.65mmol/l or a drop of >0.16mmol/l electrolytes should be measured 2-3 times daily and supplemented if needed	GPP	100		
57. Energy restriction in refeeding hypoPO4	In pts with refeeding hypophosphataemia energy supply should be restricted for 48hrs and then gradually increased	B	100		
Monitoring EN tolerance				D1. Monitor EN tolerance daily Avoid inappropriate cessation of EN Limit NPO orders to limit ileus and prevent inadequate nutrition delivery. *Expert consensus* D6. Do not automatically interrupt EN for diarrhoea. Evaluate aetiology of diarrhoea	
Feeding protocols	Include: -Consideration of postpyloric feeding with persistent large GRV on gastric feeding. -Consideration of percutaneous access with prolonged feeding. -Bowel management protocol -Blood glucose control and insulin infusion protocol -Daily assessment of feed volume delivery -Patient weighing (ESPEN position paper 2018 Monitoring nutrition in ICU)			D3a. Use feeding protocol to increase overall kcal delivery *Moderate to high quality evidence* H1. Use protocols and nutrition support teams to maximise efficiency and reduce risk associated with PN. *Expert consensus*	5.1. *Consider* using a feeding protocol that includes strategies to optimise nutrition delivery
Prevention/Monitoring	Prevention of aspiration:			D4. Assess aspiration risk.	5.4. *Recommend* a head of bed elevation

for aspiration	-Bed head tilt up 30 to 45 degrees -Assessment of gastric filling by ultrasound, or measurement of GRV in patients during initiation of enteral feeding, particularly with unprotected airway (ESPEN position paper 2018 Monitoring nutrition in ICU)	Take steps to reduce risk of aspiration *Expert consensus* D4d. Employ nursing directives to reduce aspiration risk. HOB elevation of 30-45 degrees. Use chlorhexidine mouth wash bd. *Expert consensus* D5. Do not use blue/or any colour food dye/glucose oxidase strips to test for aspiration. *Expert consensus*	of 45 degrees, if not possible raise head of bed as much as possible
Monitoring biochemical parameters	-Glucose: First 24 hrs of ICU admission/feeding: every 4-6 hrs Later: at least 2 times daily -Phosphate Within first 6-12 hrs of admission. Later: once a day -Potassium First 24 hrs of ICU admission/feeding: every 6 h with blood gases -Sodium, Chloride, Magnesium: once daily -Liver tests: AST, ALT Twice weekly -Triglycerides: Twice weekly -Prealbumin: Once weekly -Glutamine: In selected cases (renal replacement therapy, burns, PN without glutamine) -Trace elements: Cu, Se, Zn In selected cases (such as e.g. burns) -Urea in blood: 3 times weekly -Urea in urine: 6-hr urine collection once weekly in absence of renal failure -Ammonium: In case of unexplained worsening of consciousness state -Carnitine: Considering the limited availability and cost, to be done only		

	in presence of unexplained rapid muscle catabolism and hyperlactatemia with adequate protein supply. (ESPEN position paper 2018 Monitoring nutrition in ICU)		
EN formulation		E1. Use standard polymeric EN. Avoid speciality formulas/dx specific formulas. Expert consensus. E2. Do not use immune modulating formulae (arginine, n-3s, glutamine, nucleic acid) *Very low quality evidence* E4a & b. Do not use mixed fibre formula routinely. Consider in persistent diarrhoea. Avoid in pts at high risk for bowel ischaemia or severe dysmotility. Consider small peptide feed in persistent diarrhoea unresponsive to fibre *Low quality evidence* *Expert consensus* F1. Consider a fermentable soluble fibre supplement in all haemodynamically stable ICU pts. Use 10-20g soluble fibre in divided doses if there is diarrhoea. *Expert consensus* I2. Consider use of fluid restricted energy dense EN formulations in acute respiratory failure especially if volume overloaded *Expert consensus*	4.3 *Consider* whole protein polymeric feeds rather than peptide based feeds 4.4 Insufficient data to make a recommendation on low pH diets. 4.5. Insufficient data to recommend the routing use of fibre. Potential for harm in select pts (haemodynamically unstable, risk of bowel ischaemia, severe, significantly suppressed gut motility)
Probiotics		F2. Cannot make a recommendation for routine use of probiotics. *Low quality evidence*	6.2. *Consider* probiotic use (not able to recommend a specific dose or probiotic except do not use S. boulardi, considered unsafe in ICU patients)

Compounded vs. commercially available PN	H4. No advantage to using commercially available PN vs. compounded admixtures. *Expert consensus*	
Respiratory failure	I1. Do not use high fat/low CHO formulations in ICU pts with acute respiratory failure (avoid overfeeding; avoid rapid infusion of IV fat emulsions especially soy based). *Very low quality evidence* I2. Consider use of fluid restricted energy dense EN formulations in acute respiratory failure especially if volume overloaded *Expert consensus*	3.3a. An initial strategy of trophic feeding for 5 days *should not be considered* in ALI pts 4.1bi. *Consider* use of an enteral formula with fish oils, borage oils and antioxidants i.e. Oxepa in ARDS/ALI.
Renal failure	J1. Use standard EN in AKI pts, with protein of 1.2-2g/kg and energy of 25-30kcals/kg. If significant electrolyte abnormalities develop consider a lower electrolyte feed designed for renal failure. *Expert consensus* J2. Pts on frequent IHD or on CRRT need up to 2.5g/kg protein. Protein should not be restricted in AKI as a means of avoiding/delaying dialysis. *Very low quality evidence*	
Hepatic Failure	K1. Use a dry weight to determine energy and protein requirements. Avoid restricting protein – feed as per other ICU patients. *Expert consensus* K2. Use EN ahead of PN in acute and or chronic liver disease. *Expert consensus*	

	K3. Use standard EN formulations. No evidence for BCAAs. *Expert consensus*
Acute pancreatitis	L1a. Evaluate dx severity to direct nutrition therapy. *Expert consensus* L1b. In mild acute pancreatitis advance to oral diet as tolerated. If complications occur or dx severity worsens use specialised nutrition therapy. *Very low quality evidence* L1c. In mod to severe dx use naso-enteric feeding, start at trophic rate and increase to goal within 24-48hrs if pt fluid volume resuscitated. *Very low quality evidence* L12. Use a standard EN formula *Very low quality evidence* L3a. Use EN over PN. *Low quality evidence* L3b. Provide nutrition NG or NJ, no difference in tolerance or outcomes. *Low quality evidence* L5. Consider use of probiotics in severe acute pancreatitis pts on EN. *Low quality evidence* L6. If EN not feasible in SAP consider PN after 1 week of pancreatitis episode. *Expert consensus*
Chronically critically ill	P1. Recommend that chronically critically ill pts (defined as those with

	persistent organ dysfunction requiring ICU LOS>21 days) be managed with aggressive high-protein EN therapy and, that when feasible a resistance exercise program be used. *Expert consensus*	
End of life care	R1. Artificial nutrition and hydration is not obligatory in cases of futile care or end of life situations. Decision should be based on evidence, best practices, clinical experience and judgement; effective communication with the patient, family, respect for patient autonomy and dignity.	
Closed vs. open EN delivery system		6.1 Insufficient data

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