# The ABC of the Neurosurgical Patient

A dietitian's perspective

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# Overview

The nutrition care process

- Nutrition screening & assessment
- Anthropometry
- Biochemistry
- Clinical
- Dietary
- Estimated Nutritional Requirements

Summary of recommendations

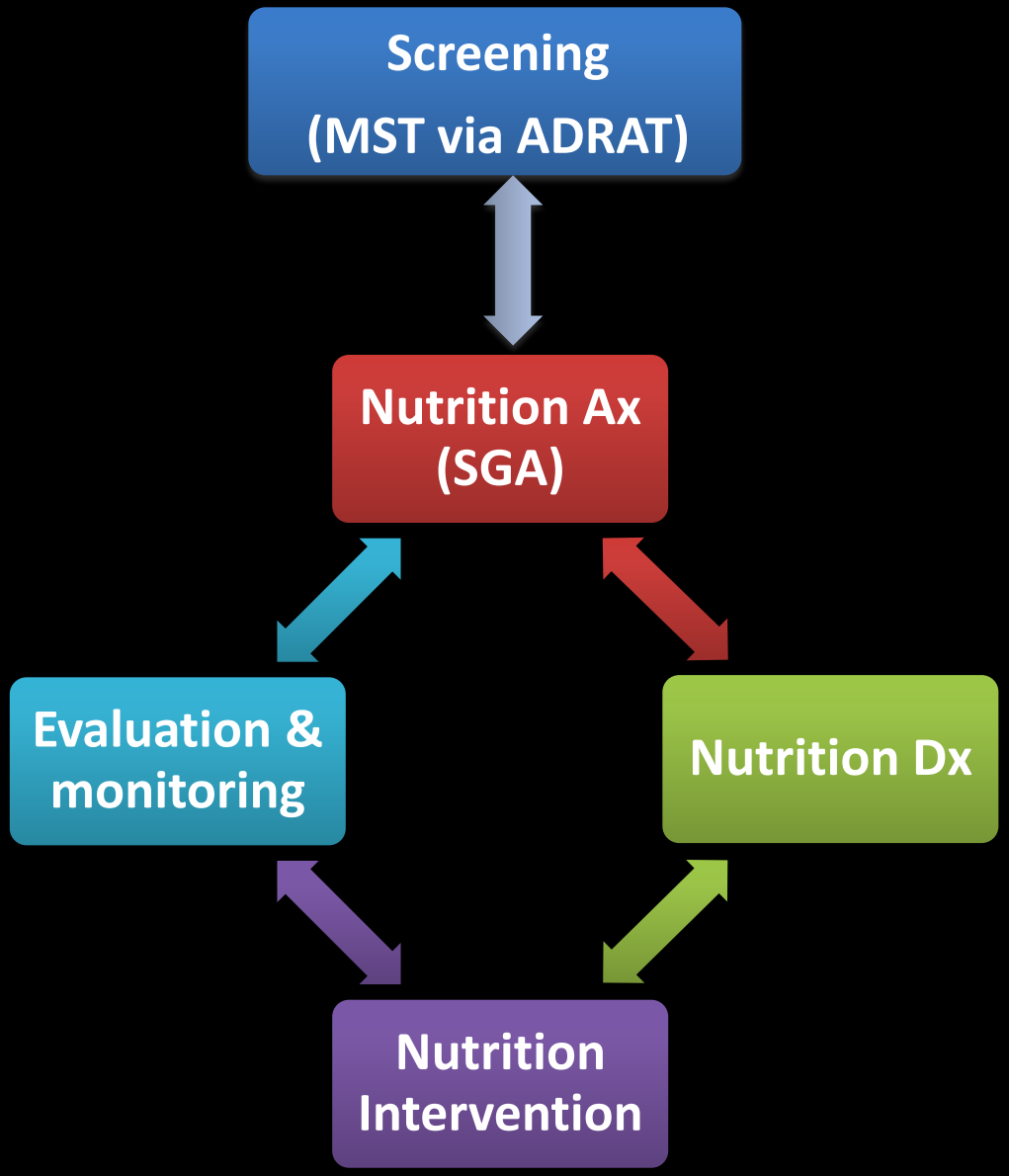
**In relation to the neurosurgical patient**

A

B

C

# Nutrition Care Process




A

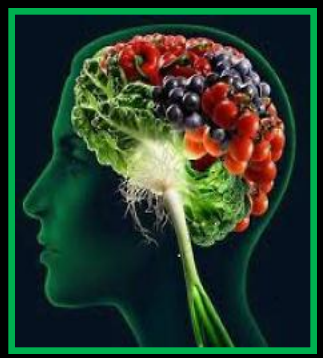
B

C

# A- Anthropometry

- **Weight:**
  - **Current wt., wt. hx, intentional vs unintentional LOW**
  - **fluid overload/oedema**
  - **Component of SGA**
- **Height**
- **BMI**

| BMI | Classification |
|---|---|
| <18.5 | Underweight |
| 18.5-24.9 | Healthy weight |
| 25-29.9 | Overweight |
| 30-34.9 | Obesity class 1 |
| 35-39.9 | Obesity class 2 |
| ≥ 40 | Obesity class 3 |
| 22-27 | HWR >65yo |



# A- Anthropometry

**Challenges faced in the neurosurgery pt:**

- What is an acceptable LOW
  - Complications of overfeeding
  - Expected muscle atrophy when bedbound

- Those on either spectrum of the HWR are more likely to have prolonged recovery
  - However potentially less affect on obese neurosurgery pt..

- Wt. pre & post sx does not accurately reflect nutritional status (oedema, hydration status, fluid resuscitation, CCF, CKD etc)

# B - Biochemistry

| Test | Use | Relevance |
|---|---|---|
| Albumin | • -ve acute-phase respondent<br>• Long half life (~21d) | • ↓ in malnutrition<br>• ↓ in stress response therefore must be interpreted with caution |
| Pre-albumin | • -ve acute phase respondent<br>• Short half life (2d ) | • Rapidly responds to improved protein intake |
| CRP | • +ve acute phase protein | • ↑ in infection, inflammatory disorders, tissue trauma and malignancy |
| EUC/ CMP | • Refeeding syndrome markers<br>• Hydration markers<br>• SIADH | • A drop in electrolytes on commencement of feeding may suggest refeeding syndrome<br>• Excessive losses in diarrhoea, vomiting, diuresis, fever or low PO intake |
| Phenytoin | Monitor effectiveness of seizure pharmacotherapy | • Drug-nutrition interaction |

# B - Biochemistry

**Challenges faced:**

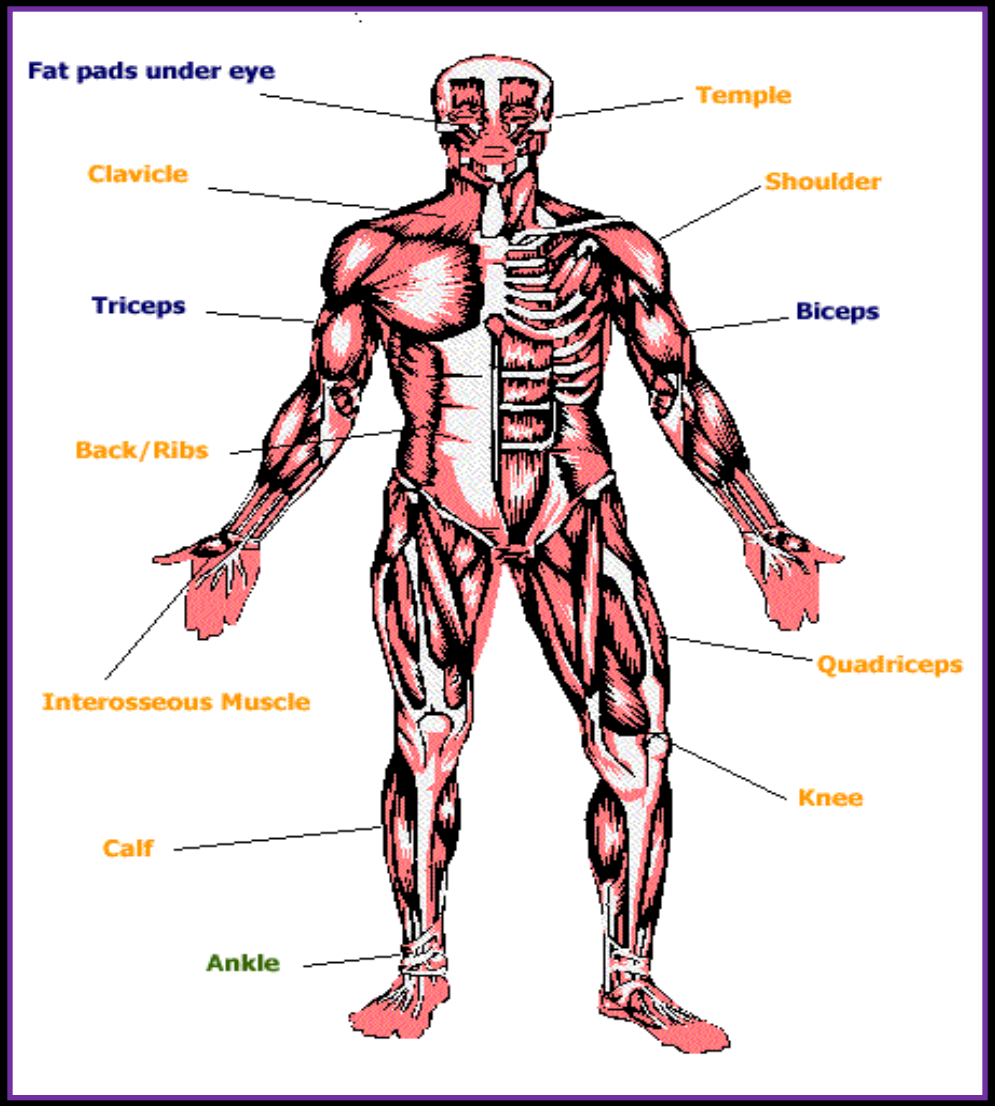
- Referrals for low albumin in the acute phase
- Improved nutrition despite low albumin
- High refeeding syndrome risk.
  - Slow caloric intake (1-2/52 to reach goal)
  - Daily monitoring EUC/CMP
  - Thiamine, multivitamin and electrolyte supplementation
- Fluid balance: IVAbx, diarrhoea, febrile, NGT vs PO, TF, drowsy, etc.

# C - Clinical

## Subjective Global Assessment (SGA)

- A method of assessing ones nutritional status based on clinical findings (60%)  and physical examination (40%)
- A tool to dx malnutrition
- SGA A (well nourished) B (mild-moderate malnutrition) C (severe malnutrition)
- Malnutrition → increased morbidity, mortality, and LOS

# C - Clinical




**Medical Hx 60%**

**Physical 40%**

A

B

C

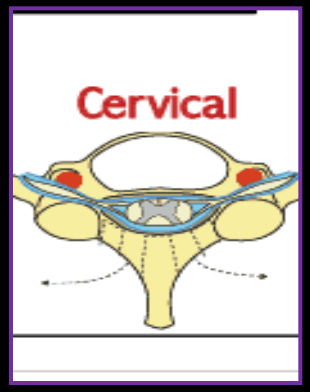
# C - Clinical

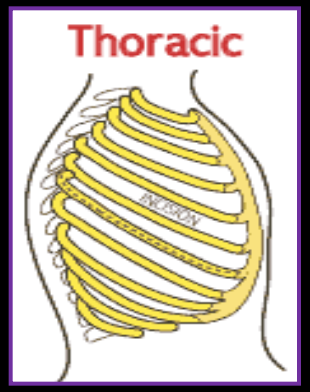
A

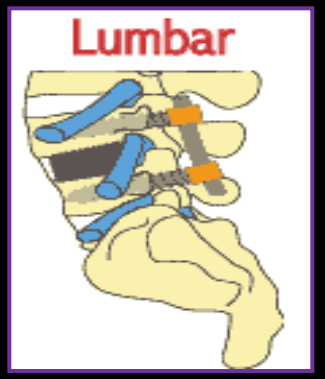
B

C

| Cervical | Thoracic | Lumbar |
| --- | --- | --- |
| Anterior discectomy + fusion | Laminectomy | Micro discectomy |
| Anterior vertebrectomy + fusion | Thoracotomy /vertebrectomy + fusion | laminectomy |
| Laminectomy | Thoracotomy + discectomy | Far lateral discectomy |
| Laminoplasty | Posterior vertebrectomy + fusion | microlaminectomy |
| | foraminotomy | Posterior interbody fusion |
| | | Spinal infusion |
| | | Anterior vertebrectomy+ fusion |
| | | Instrumented posterior fusion |



# C - Clinical

## Common nutritional impact symptoms post neuro/spinal Sx

| Symptom | Nutrition Intervention |
|---|---|
| **Nausea** | ced foods, antiemetic's, sour + ks |
| **Vomiting** | + post meals, small sip introduce |
| **Drowsin** | foods, ONS, NAM, |
| **Weakness** | xterity concerns, ass cut up diet. |
| **Confusion** | meals, initiation of tasks inc |
| **Seizures** | If on enteral feeds, cease feeds 2h pre and post phenyt |
| **Fever** | Increased energy and fluid needs |
| **Stiff neck or neck brace** | Texture modified diet eg minced and moist, assistance with meal set up and E+D, OT – modified utensils |
| **Dysphagia** | Enteral feeds or texture modified diet |
| **Anorexia** | Small frequent meals, HEHP snacks, PO hygiene, meals from home, non perishable snacks |
| **Constipation** | Encourage fluids, fibre and aperients especially if on strong analgesia. Faecal loading → LOA and early satiety. |

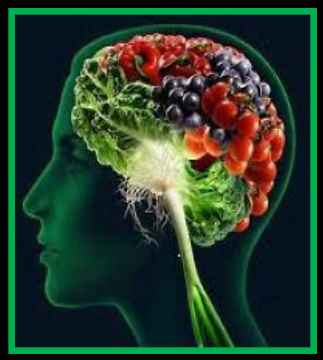
PAIN

ANOREXIA

# C - Clinical

Other factors a dietitian will consider prior to nutrition dx:

- PMHx
- Social
  - support network, smoker, EtOH, ADLs/domestic duties, CALD, health literacy, financial situation, premorbid PA/function
- Psychological factors
  - mental health, anxiety, stage of change
- Other
  - dentition, cognition, hearing/sight impairment



# D - Dietary

What people think a hospital kitchen looks like…

What people think a dietitian does…

A

B

C

# D - Dietary

What a dietitian really does…

What a hospital kitchen actually looks like…

A

B

C

# D - Dietary

| | E. (kcals) | % EER | P. (g) | %EEP |
|---|---|---|---|---|
| **FULL** | | | | |
| B: cereal, milk, sugar, bread, marg, jam, OJ, tea | 520 | | 15 | |
| L: chicken hollandaise, mash, veg, crumble & custard, bread, marg, OJ | 980 | | 39 | |
| D: soup, roast beef & gravy, potato, bread, marg, OJ, panna cotta | 735 | | 46 | |
| MM: tea + biscuits | 50 | | 1 | |
| TOTAL: | 2285 | 76 | 101 | 76 |
| **HIGH ENERGY HIGH PROTEIN** | | | | |
| B: cereal, milk, sugar, bread, marg, jam, scrambled egg, prunes, OJ, ENSURE PLUS | 1015 | | 36 | |
| L: chicken hollandaise, mash, veg, crumble & custard, bread, marg, OJ + salmon salad | 1325 | | 64 | |
| D: soup, roast beef & gravy, potato, bread, margarine, OJ, panna cotta, Resource Fruit Beverage | 985 | | 55 | |
| MM: flav milk + ½ s/wich + cheese & biscuits | 505 | | 22 | |
| TOTAL: | 3830 | 128 | 177 | 133 |
| **SMOOTH PUREE, MILDLY TF** | | | | |
| B: pureed oats, TF milk, fruit puree, sugar, juice TF | 455 | | 13 | |
| L: Pureed chicken casserole, mash, puree peas & sweet corn, lemon dessert, juice TF, | 615 | | 39 | |
| D: soup, puree beef casserole, mash, puree cauliflower in cheese sauce, puree beans, juice TF, chocolate crème. | 675 | | 51 | |
| MM: Custard snack pack | 145 | | 4 | |
| TOTAL: | 1890 | 63 | 107 | 80 |

# D - Dietary

A

B

C

**Challenges faced by the dietitian:**

- Nutrition impact symptoms
- Volume of food required to meet needs
- Meals may coincide with therapy, tests, procedures
- Lengthy meal times → time burden on NS
- Large hospital with diverse pt population → difficult to meet the needs of all pts
- Lack of ONS for those on texture modified diet
- Food service issues
- Positioning → traction, aspiration, maintaining 30◦

# D - Dietary

| Monitoring Enteral Feeds | |
|---|---|
| **Problem** | **Action** |
| **Epilepsy** | ✓ Check if phenytoin is charted (WH feeds 2h pre/post dose) |
| **Reflux, vomiting, impaired gastric motility.** | ✓ Medication RV (antiemetic's, PPI, prokinetic agent)<br>✓ Check tube placement<br>✓ Check gastric aspirates<br>✓ Adjust feed: osmolality, concentration, rate, timing, volume, route eg gastric vs post pyloric<br>✓ WH feeds at least 30mins before transfers or PT<br>✓ Monitor PO hygiene<br>✓ Ensure upright positioning<br>✓ Check for abdo distention or discomfort |
| **Diarrhoea** | ✓ Check IVABx and consider probiotic supplement<br>✓ RV medications eg cease aperients magnesium<br>✓ Fibre supplementation<br>✓ Semi-elemental/elemental feed<br>✓ Monitor stool and bowel chart ?faecal loading |
| **Constipation** | ✓ Monitor fluid balance → may need increase H20<br>✓ Consider fibre supplementation or fibre enriched feed<br>✓ Medication RV: analgesia, aperients |
| **Removal of NGT** | ✓ Soft hand restraints or bridal NGT<br>✓ Assess external tubing position or irritation as well as x-ray position confirmation |
| **Dehydration** | ✓ Rv fluid requirements (eg if febrile) and Ax fluid balance (input vs output)<br>✓ Ax if hypertonic dehydration (consider lower protein feed)<br>✓ Consider a less concentrated feed |

# D - Dietary

A

B

C

**Challenges faced by the dietitian in enteral feeding**

- Overfeeding shortly after major sx, major sepsis, or multitrauma
- Overfeeding
  - Hypercapnea : ↑C02 →respiratory compromised
  - Hypertonic dehydration if too much protein
  - Hyperglycaemia : neurological impairment
- Positioning: traction, maintaining upper body atleast 30◦, aspiration prevention
- Missed nutrition due to procedures, personal cares, therapy etc
- Incorrect feeds
- NGT removal: agitation, confusion,  X-ray position confirmation

# D - Dietary

A

B

C

## Other practical considerations to improve nutrition

- Good oral hygiene
- Pt to sit out of bed if able
- Food preferences via CBORD  (extra sauces, gravies, stock to moisten food)
- Adjusting EN feed times when PO intake
- Food charts
- Encourage family to bring food and assist with eating
- Simplify messages and avoid the use of the term ‘diet’
- Negotiate - work on what the pt can do,  not what will result in the biggest improvement
- Knowledge -  educate pt why nutrition is important
- Emphasise things to do, not to avoid
- Encourage the energy/protein dense foods first
- Separate fluids from food if early satiety
- NGT vs PN → If the gut is working, use it

# E - Energy

A

B

C

**Spinal reconstruction Sx**

- ↑nutritional requirements due to postop catabolism + ↓ nutritional intake
- High risk of nutritional decline
- No special nutrition guidelines
- Case by case
- Other considerations:
  - Adjusted bodyweight for overweight pts
  - Activity factor (1.2 for bed rest)
  - Injury factors (1.1-1.3 minor op, 1.4-1.8 sepsis)

# E - Energy

A

B

C

Some neurological guidelines…

- Head Injury:
  - 35-40kcals/kg/d
- Post Procedure
  - 35-40kcals/kg/d eg SAH, ICH
- Sepsis
  - 35-40kcals/kg/d
- Repletion
  - 30-35kcals/kg/d

# E - Energy

A

B

C

## Estimated Protein Requirements:

- 0.8- 1.0g/kg/d for normal metabolism
- 1.2-1.6g/kg/d for hypermetabolism

## Neurological Conditions

- Post procedure: 1.5-2.0g/kg/d
- Sepsis: 1.5-2.0g/kg/d
- Repletion: 1.2-1.5g/kg/d

# Summary

- Nutrition screening can identify pts at risk of malnutrition or who were malnourished pre admission
- Very challenging area with no specific guidelines therefore treat case by case
- Use clinical judgement, think outside the box
- Refer to other AH
- Nutrition intervention is difficult due to many nutrition impact symptoms and other external barriers eg food service, minimal ONS for texture modified diets, pt positioning

A

B

C

# Summary

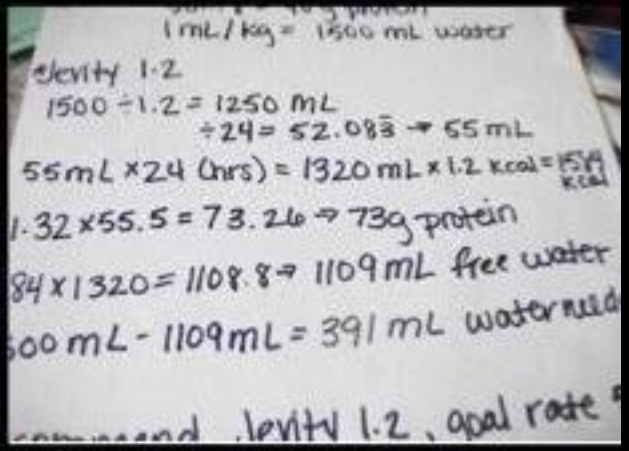
What my friends think I do

What society thinks I do

What my patients think I do

What doctors think I do

What I think I do




What I actually do

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