

# Nutritional **Compounding** **101**

**For Healthcare Practitioners**

everything you need to know (and wished you knew sooner)  
to get started with Nutritional Compounding in your clinical practice

---

Presented by

**Warren Maginn**

BHsc (Nutr. Med.), GradCert (Hum. Nutr.)

Ever wondered what's inside your supplements?

Looking to take control?



Are You Ready To Go To The Next Level?



# Agenda





## **Assumed/Pre-Requisite Knowledge:**

- **Clinical Qualifications**  
(in an 'Ingestive' Modality)
- **Nutritional Biochemistry**  
(Studied Biochemical Physiology and How Nutrients Work)
- **Nutritional/Functional Medicine Principles**  
(Seek Cause, Work with Body Function, Personalise Treatments)

### **Beginner Level**



This material is intended to assist qualified practitioners to get started in effectively compounding natural medicines for their patients.



# Introduction

What is Compounding?

# What is Compounding?

- What does the word mean?

**compound** (kŏm-pound', kəm-, kŏm'pound,) ▶

- v. To **combine** so as to form a whole; mix.  
(*compound* a medicine)
- n. Chemistry; A **pure**, macroscopically homogeneous **substance** consisting of atoms or ions of two or more different elements in definite proportions that cannot be separated by physical means.

# A Brief History

- What are the origins of compounding?  
(what medicine has always been)
- Modernisation: Moved to Mass Production
- Herbal Medicine retained some Custom Medicine
- Nutritional Medicine advanced AFTER Modernisation
- Importance of Customised Medicine is returning  
(Functional and Integrative Medicine)
- Time to catch up!  
(Old-school Attention + Modern Science = Best Care)



# Medicine Regulation

(For Mass-Produced Medicines)

HEALTH CANADA

Health Canada

MHRA

UK - Medicines & Healthcare  
Products Regulatory Agency

FDA

USA - Food and Drug Administration

TGA

Australian - Therapeutic  
Goods Administration

# What is a Therapeutic Good?

- A product that implies a restorative health benefit from it's use  
(has health claims made about it)
- Or is presented as a medicine  
(in it's delivery, packaging or context)

# The Regulation of ALL Therapeutic Goods in Australia

## Body:

- The Therapeutic Goods Administration (**TGA**)

(Governs Products  
NOT Practitioners)

## Legislation:

- The Therapeutic Goods **Act** 1989
- The Therapeutic Good **Regulations** 1990

(The What, Who, Why & How  
of Making Medicines)

## Regulatory Instrument:

- The Australian Register of Therapeutic Goods (**ARTG**)

(The Registry List of  
ALL Approved Products)  
(AUST-L and AUST-R)

# **The Regulation of Complementary Medicines in Australia**

## Regulatory Guidelines:

- The Australian Regulatory Guidelines for Complementary Medicines (**ARGCM**)  
(An Overview of all regulations pertaining to CM specifically)

## Exemptions:

- Certain Complementary Meds are exempt  
(from requirement to be registered on the ARTG)



## **Which Medicines are Exempt?**



## Therapeutic Goods Regulations 1990

Statutory Rules No. 394, 1990 as amended

made under the

*Therapeutic Goods Act 1989*

### **Schedule 5: (*Exempt Medicines*)**

#### **Item 6**

Includes exemption from the requirement to register on the ARTG list, medicines that are:  
**dispensed or extemporaneously compounded** for a particular person, by a qualified healthcare practitioner.

# Who Can Make Compounded Complementary Medicines?



## **Therapeutic Goods Regulations 1990**

**Statutory Rules No. 394, 1990 as amended**

made under the

*Therapeutic Goods Act 1989*

### **Schedule 8: (*Exempt Professionals*)**

#### **Item 4**

Specifies that certain Healthcare Practitioners are exempt from needing GMP Certification in order to make medicines – on certain conditions...

# Conditions of The 'TGR' Provisions

Exempted Healthcare Professionals includes:

- Nutritionists
  - Naturopaths
  - Herbalists
- engaged in the manufacture of any herbal or nutritional supplement preparations
- (with registration as a Member of an Accredited Professional Association)

## Australian Complementary Health Practitioner Associations

(Specified by The TGR 1990)

- Includes: ANTA, NHAA, ATMS, ANPA, CMA, ...

# Conditions of The 'TGR' Provisions

## Compounded Comp Meds Must Be:

- Manufactured on the premises, by the practitioner, in the course of their professional business
- After private consultation with an individual patient (excluded from the public)
- Using the practitioner's **own** qualified professional judgement  
(based on their education, expertise, understanding and knowledge of the person and case)
- Excluding the use of any restricted ingredients: (e.g. Pharmaceuticals, Narcotics, Poisons, etc.)
- Appropriately Documenting Formulas, Prescriptions & Labels

# Which Ingredients Can Be Used?

## Common Ingredients For Compounded Complementary Medicines

- Proteins & Amino Acids
- Vitamins & Provitamins
- Minerals
- Lipids & Fatty Acids
- Saccharides & Fibres
- Enzymes
- Probiotics
- Botanical Compounds & Functional 'Food' Ingredients
- etc.

### Dosage Forms:

Powders, Liquids, Gels, Creams, etc.

- With sufficient Purity & Identification
- According to Scope of Practice & Excluding Any Regulated Substances

# Which Dosage Form Is Best?

## Why Dry Powders Are Preferable

- Easy and predictable to mix
- Easy to measure and dose
- Comparatively stable and spoilage resistant
- (Translates to longer shelf life preparations)
- Requires minimal excipient use
- 'Activated' simply by mixing with water (as and when required)
- ...



# How are 'Ingredients' Different to 'Products'?

(Raw and Pure Singles -vs- Pre-Combined Commercial Blends)

# Can Compounded Formulas Be Pre-Packed?

- **No**
- A pre-packaged product would need to be registered on the ARTG
- And made by a TGA GMP Audited and Certified Facility
- Compounded Supply is for a particular person after a particular consultation
- “Extemporaneous”:

**extemporaneous** (ĭk-stĕm,pə-rā'nē-əs) 

adj. Carried out or performed with little or no preparation; impromptu  
(‘tempor’ meaning time – in the current time, as ‘one of a kind’)

# Compliant Promotion of Therapeutic Products

The Therapeutic Goods Advertising Code (**TGAC**) stipulates that any marketing:

- Promotes the quality and appropriate use of the product
- Is socially responsible
- Does not mislead or deceive the consumer
- Does not portray any regulated substances (e.g. S4, etc.)
- Does not portray prices

## Tip:

- Due to complexities of regulations, and requirement to make 'one-off' formulations, it is usually more appropriate to simply advertise services, rather than any particular custom formulation.



# Why Compound?

Reasons To Compound



## Reason 1

- **Tailored Supplementation**  
(For better suitability than any mass-produced product)
- **Personalised Medicine**  
(Strategic/Precision Prescriptions - dosing to meet individual needs)



## Reason 2

- **Better Control**  
(Easier to plan quantities required for either short-term acute dosing or longer term pack sizes for chronic prescriptions)
- **Better Flexibility / Adaptability**  
(Ability to monitor and adjust prescriptions based on efficacy or changing needs over time)



## Reason 3

- **Ingredient Access**

(Addresses the need for ingredients and doses not otherwise available)

- **Get Ahead of The Curve**

(Adapt to emerging research quicker than most commercial products)



## Reason 4

- **Reduced Redundancy**  
(Prevents unnecessary or wasteful doubling up of Ingredients)
- **Increased Safety**  
(Avoids potentially burdensome overlap of ingredients interfering with clinical success and safety)





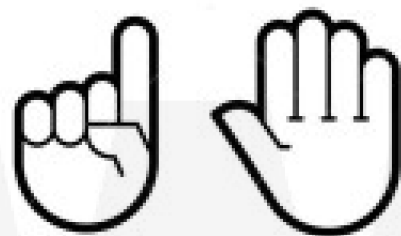
## Reason 5

- **Increased Quality**

(Better control over quality and grade of ingredients, than typically used)

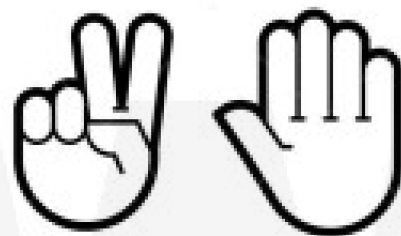
- **Increased Purity**

(Greater control and avoidance of excipients - such as flavours, sugars, lactose, gluten, colourants, preservatives, alcohol, and other common disrupters/allergens - for sensitive patients)



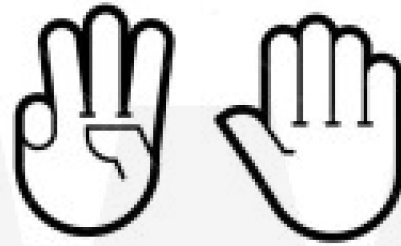
## Reason 6

- **Patient Compliance**  
(Through the convenience of ONE consolidated dosage form)
- **Patient Retention**  
(Exclusivity of Formula - cannot be readily bought elsewhere)



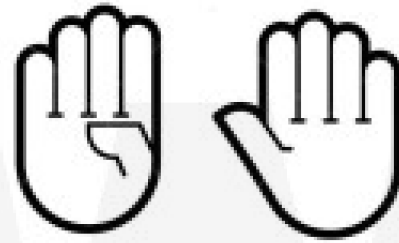
## Reason 7

- **Increased Efficacy**  
(Active forms, doses and customisation = greater efficacy)
- **Improved Clinical Outcomes**  
(Retention supports the time-frames required to get better results)



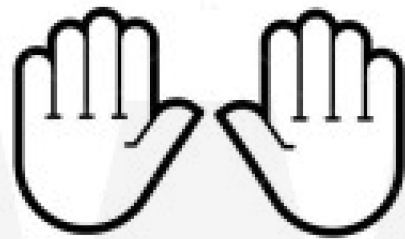
## Reason 8

- **Rapport & Reputation**  
(Results = Clinical Reputation = Return Business)
- **Wow Factor!**  
(Going the extra mile – a point of difference - setting your practice apart)



## Reason 9

- **It's Fundamental to Nutritional Medicine Practice**  
(Commercial products alone will never fill every gap, or what is possible)
- **Advance The Profession**  
(Avoid diluting the profession – raise the standards of what's achievable)



## Reason 10

- **Use it or Lose it**  
(Keep the provisions alive - through active use)
- **Maintain Scope Of Practice**  
(Ensure the ongoing suitability and value of compounding is demonstrated)

# How to Keep The Regulatory Provisions Alive

- **Act Responsibly**  
(First do no harm, ethics, strive for success, focus on the benefit to patient...)
- **Be Compliant With All Regulations**  
(Qualifications, Ingredients, Advertising, etc.)
- **Educate Yourself!**  
(Never stop studying)
- **Do Your Diligence**  
(Take good case information, and make well researched decisions)
- **Maintain Best Practices**  
(Cleanliness, hygiene, stock quality control, record keeping, prescriptions, etc.)



# Equipment

What Do You Need?



# The Basics

(To get up and running with compounding)

1. Clean Work Area
2. Personal Protection Equipment (PPE)
3. Quality Scales
4. Scoops
5. Mixer
6. Empty Containers
7. Labels
8. Ingredients!

# Clean Work Area

(Preferably Designated Dispensary Area)

## With:

- Bench (with food-grade surface)
- Contaminant & Clutter-Free with Lined Bins
- Sink & Cleaning Equipment (e.g. wipes, and food-grade surface disinfectant, etc.)

## Dispensary Storage

- Cool, Dark, Dry Area
- Sealable Food-Grade Containers
- With Clear Labels & Expiry Dates Marked  
(Monitor Expiry Dates)



# PPE

## Personal Protection Equipment

- Disposable Gloves  
(powderless for food service)
- Apron  
(Waterproof - disposable if desired)



# Quality Scales

- **Medium Scale**  
(accurate to 0.1g - up to at least 1,000g (1kg) total)
- **Small Precision Scale**  
(accurate to 0.001g (1mg) - up to at least 20g total)

\* Scales MUST have Lid and Calibration Weights



# Scoops

## Note:

- $\text{cm}^3 = \text{cc} = \text{ml}$
- Consult Ingredient **Density Values**  
(to determine the dose per scoop)
- All scoop serves are '**level**' scoops  
(unless otherwise stated)

0.15ml

1ml

0.625ml ( $\frac{1}{8}$  tsp)

1.25ml ( $\frac{1}{4}$  tsp)

2.5ml ( $\frac{1}{2}$  tsp)

5ml (tsp)

15ml (Tbsp)



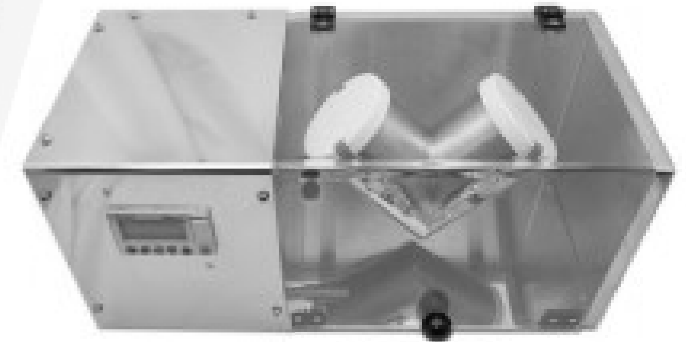
# Auto Blending Mixer

(To Homogenise Mixture)

- **Automatic**

Pros: Effort Free, Perfect Blend, Save Time

Cons: Cost, Complexity of Cleaning/Use



Capacity: 0.5 – 2 L

Cost: \$1500 - \$2000

- **Semi-Automatic**

Pros: Thorough Blend, Easier Cleaning

Cons: Cost, Time, Potentially Difficult to Use



Capacity: 1.5L – 2 L

Cost: \$1200

# Manual Blending Mixer

- **Manual**

Pros: Low Cost, Low Complexity, Ease of Use, Easy Clean, Good Blend

Cons: Requires Active Participation

Choose:

- Transparent
- Easy seal mechanism
- With flat and curved surfaces
- Largest that can be easily held



Capacity: 4L – 10L

Cost: \$10 - \$20

# Empty Containers

Choose:

- Glass or HDPE Plastic
- With single seal (tamper resistant) lids
- At least 2 sizes

90ml



185ml



400ml



1500ml (1.5L)





# Powder Funnels

Ideal **Upper** Opening:

- Shallow depth - with opening over 10cm diameter



Ideal **Spout** (for Filling Small Tubs):

- Outer Diameter (OD) as close to 3cm (1.18")

Ideal **Spout** (for Filling Larger Tubs):

- Outer Diameter (OD) as close to 5cm (1.96")

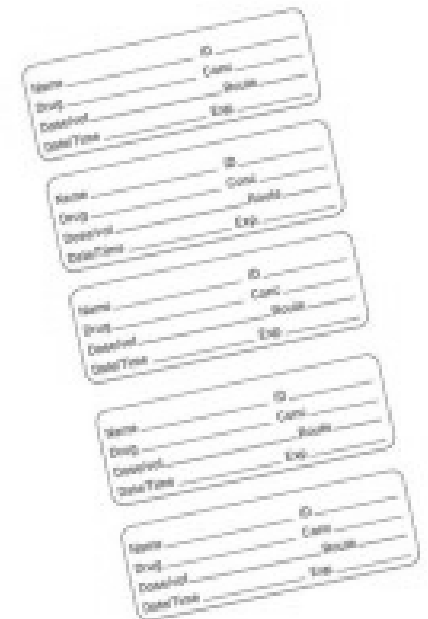


# Dispensing/Prescription Labels

- Label must show all essential elements of the prescription (see Procedures for the essential information elements)

Choose:

- Wide Width
- Shallow Height
- (Ideal for container versatility)
- Fields (or enough space) for all required information elements

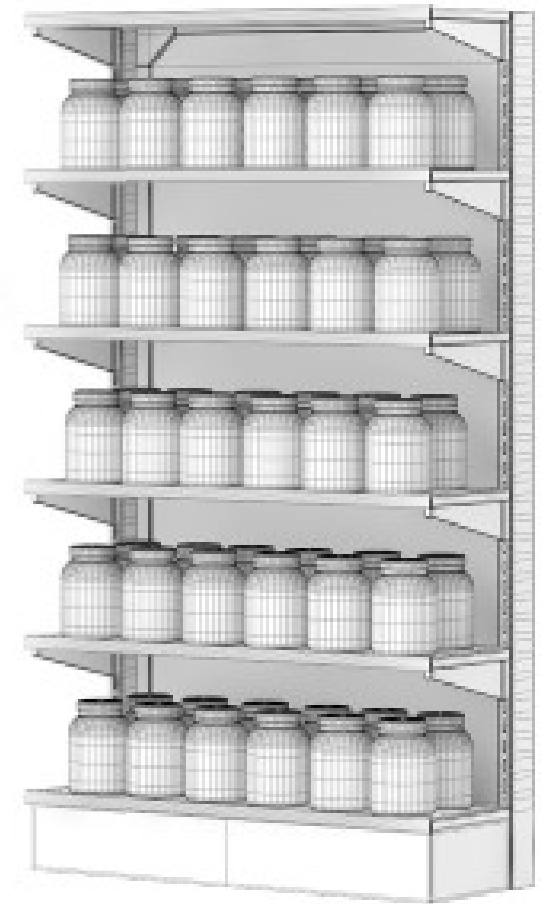


# Ingredients!

- **Note:** Sourcing matters!
- **Density** between sources of the same ingredient varies

Choose:

- Highest Quality you can find (Pharmaceutical-grade)
- Pure (no excipients or contaminants)
- Clearly labelled (well identified)
- With Density Values Specified (for calculating dosing)
- Smaller Bulk Pack Sizes (keeps fresh and affordable)
- Convenient Containers (for dispensing singles)





# **Key Concepts**

Things You Need To Understand

# Understanding Quantities

### Unit Quantity Conversions

Quantities by Weight

Quantities by Volume

Note:  
1 mg = 0.001 g  
100 mg = 0.100 g  
1,000 mg = 1.0 g

Quantity Conversions by Weight  
(The Weight of Molecules)  
e.g. For Measuring Quantities of Dry Powder Ingredients

Amount

Units

=

Equivalent

1

g

=

1000000.000

mg

=

1000.000

mg

=

1.000

g

=

0.001

g

[wmed.link/quantities](http://wmed.link/quantities)

### Calculate Percentages Easily!

Use this calculator to figure out percentage values easily.  
(e.g. when working with price changes, ingredient quantities, changes in blood test results, etc.)

What is [A] percent of [B]?

[A] 60 %

[B] 200

Result  
60% of 200 is  
120.00

[A] is what percent of [B]?

[A] 60

[B] 200

Result  
60 is what % of 200?  
30.00%

What is the % increase/decrease from [A] to [B]?

[A] 60

[B] 200

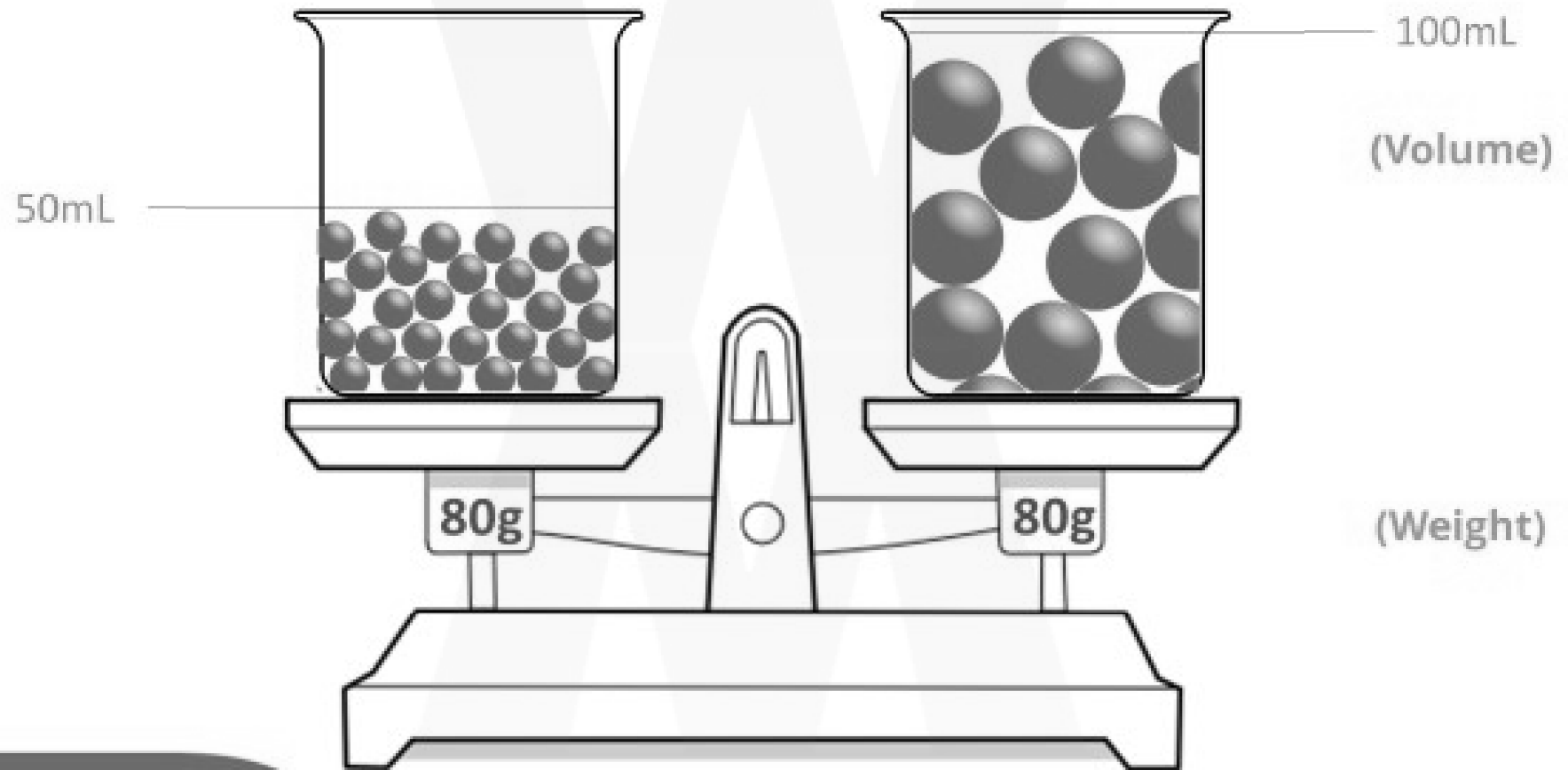
Result  
The % increase/decrease from 60 to 200 is  
233.33%

[wmed.link/percentages](http://wmed.link/percentages)

# The Issue of Density

# Density

(Weight vs Volume)



# The Density Value

- Density = Weight / Volume (Weight per unit of Volume) (g/ml)
- Allows calculation of the volume needed to achieve a certain dose

e.g.

- Measure out a **1ml** scoop of an ingredient
- If Precision Weighing shows 0.650g (650mg)
- Density = **0.650 g/ml**

Or similarly:

- Measure out Metric Teaspoon (**5ml**)
- If it Weighs 3.25g
- Density = **0.650 g/ml**



# The Density Value

## Here's the kicker!

- Not all sources of the same ingredient have the same density!



## Tip:

- Know the g/ml of each ingredient from your supplier
- Allows easy calculation of volume needed to achieve a certain dose in formula
- Also allows for easy estimation of dose per certain scoop size of single ingredient

## Note:

A Density Value is usually an **average** – as it can be subtly varied by numerous factors:

- Time, Moisture, Temperature and Oxygen Levels, etc.
- Degree of packing into scoops or the settling in tubs of formulas.



# **The Activity Factor**

# What Does 'Active' Mean?

## 'Active' Vs 'Excipient' Ingredients

- **'Active Ingredient'** means:

*"a therapeutically active component in the medicine's final formulation that is responsible for its physiological or pharmacological action"*

Therapeutic Goods Regulations 1990

- **'Excipient Ingredient'** means:

*"an inactive substance that serves as the vehicle or medium for an other active substance"*

Ingredient Type	Examples	Role
<b>Active</b> Ingredients	Vitamins, Minerals, Amino Acids, Botanicals, ...	Physiological Effect
<b>Excipient</b> Ingredients	Fillers, Colours, Flavours, Preservatives, ...	Supports Delivery of The Actives

# What Does 'Active' Mean?

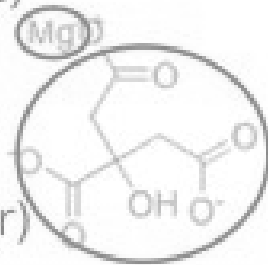
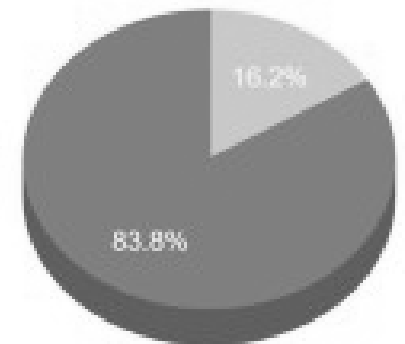
## 'Active' vs 'Other' Portions of Active Ingredients

- **'Active'**/Elemental Portion'

The primary active component of the active ingredient. (The Active of the Active)

- **'Other'**/Remaining Portion'

The portion/s with less/no relevant activity, to its intended use. (The Remainder)



e.g.

Example Active Ingredient	Active Portion	Other Portion
Glutamine	100%	0%
Larch Fibre	100%	0%
Whey Protein Isolate	90% (Protein)	10% (Other Components)
Calcium Ascorbate	89% (Vitamin C)	11% (Calcium) Also Active?
Magnesium Citrate	16% (Mg)	84% (Citrate)



# **Procedure**

## How To Compound

# Compounding

(The Sequence)

1. Perform a Case Assessment
2. Select Ideal Ingredients
3. Select Suitable Dose, Frequency, Method & Duration
4. Complete Formulation Sheet and Calculations
5. Prep Space and Measure out Correct Amounts of Materials
6. Mix Formula and Dispense Into Container
7. Label/Prescription Appropriately
8. Document Formula, Prescription & Label in Patient Records

## Step 1: The Case

- Private **Consultation**
- Take thorough **Case History**
- Evaluate **body systems** for under/over fx
- **Analyse** case  
(Using Natural/Functional Medicine Principles)  
(Determine antecedents, perpetuators, etc.)
- Perform Investigations (**Functional Testing**) as necessary
- Establish **goals** and functional targets



## Step 2: Ingredient Selection

- Select Ideal **Dosage Form**  
(Powders most versatile)
- Identify key **therapeutic ingredient/s**  
(If necessary: review ingredient databases, biochemistry, monographs and online resources)
- Choose Daily **Amount/s**  
(suitable for person, situation and goals)
- Consider **additional** active ingredients  
(based on synergism and ratios - vs - antagonism and contraindications (inc. other meds))
- Consider any **excipients** (and amount/s needed)  
(needed for dose delivery (filler), storage, compliance (taste), etc.)





## Step 3: Decide Dosing Instructions

- With or without food?  
(i.e. on empty stomach? with water soluble substances? or with fat?)
- Determine **Dosing Frequency** (Intervals per Day)  
(Dosing Intervals per Day – To divide daily amount by how many doses?)
- At what times of day?  
(Consider schedule and compliance)
- Decide **Duration** of Prescription  
(Plan Supply in Days)

X TIMES PER DAY  
FOR  
14 DAYS = 2 WEEKS  
28 DAYS = 4 WEEKS  
56 DAYS = 2 MONTHS  
84 DAYS = 3 MONTHS  
168 DAYS = 6 MONTHS

## Step 4: Document Master Formula

- Calculate Total Qty Required for each Ingredient  
(dose qty x number of doses)
- Check if enough bulk material is on-hand
- Calculate ingredient costs (\$/g x g/dose)
- Determine volume of dose (e.g. Scoop Size)
- Calculate overall Cost Price of Formula
- Calculate Sell Price of Formula (after selecting Markup)
- Educate Client on the expected duration, dosing and costs
- \* Confirm feasibility of Costs and Instructions with them before proceeding
- If in agreement, record prescription and proceed...



(remember 500mg = 0.500g)

# The Manual Method

- Fill the Formula Sheet (For You)
- Fill the Prescription (For Patient)
- Fill the Label (For Patient)

\* All should be kept on file.

Patient Name:	Patient DOB:	Practitioner Name:
Contents:	Date:	Practitioner Address:
Directions:	Duration:	Practitioner Contact:
TAKE ONLY AS DIRECTED - KEEP OUT OF REACH OF CHILDREN		

## COMPOUNDING MASTER FORMULA SHEET

Patient Name / Reference:	Patient DOB:	Patient Contact/Address:		
Date of Prescription/Supply:	Date of Completion/Renewal:	Duration: (Days)	Doses per Day:	Total Doses:
Ingredient Name:	Cost per mg (\$)	Material Qty per Dose (mg)	Total Material for Prescription (mg)	Cost per Dose (\$)
Ingredient or Product Name	Unit Price of bulk container / mg in bulk container	Dose Material to achieve target 'action' per dose	Material per Dose x Total Doses	Cost per mg x Material Qty per Dose
SUB-TOTALS:				Total Dose Price: (add up column)
TOTALS:			Total Formula Weight: (add up column)	Formula Cost Price: (Total Dose Price x Total Doses)

# What Makes A Compliant Prescription?

## Professional Association Guidelines:

A Natural Medicine Prescription Should Show:

- The **Patient's Name** and Address or DOB (for Specific Identification)
- The Prescribing **Practitioner's Name**, Contact Details, Qualifications, Signature or Authorising Seal
- All **Active Ingredients**
- The **Potency**/Strength of the Medicine (e.g. mg per dose)
- The **Dosing Unit** (e.g. 'Scoop', 'Spray')
- How Much to Take (to achieve a **Single Dose**)
- The **Dosing Frequency** (e.g. how many doses per day)
- The **Duration** of Supply (how long to take or supply will last before renewal is required)
- The **Total Quantity** of Medicine Supplied
- The **Instructions** for Use (e.g. with/without food, at certain times of day, etc.)

# What Makes A Compliant Label?

## TGA Labelling Guidelines:

A Medicine Label Should Include:

- Clearly visible, durable and legible characters
- The name(s) of all **active ingredients** in the medicine (contents)
- The **quantity** or proportion of all active ingredients in the medicine (in metric units)
- The name of the **dosage form** (e.g. 'Powder', 'Liquid')
- **Directions** for use (inc. any preparation instructions)
- The **total quantity** of the medicine
- The date or expiry for the medicine (or **duration** of treatment)
- The **storage conditions** applicable to the medicine
- Any **warnings** applicable to the medicine
- The **name** and **contact details** of the distributor of the medicine

# The Automatic Method

## Use The 'Compounding Calculator'

1. Enter All Patient & Practitioner Details
2. Specify Frequency & Duration
3. Enter Ingredients & Quantities
4. All other values will be auto calculated
5. Produces Compliant Prescription/Label!!
6. Easily Save formula as file

**Patient Name:** Jane Doe

**Patient DOB:** 12 Feb 1976

**Date of Prescription:** 01 Jan 2018

**Supply Duration / Renewal Date:** 10 days

**Dosing Intervals (Per Day):** 2

**Practitioner Name:** Dr Robert Smart

**Practitioner Contact Details:** 123 Special Street - Compoundsville 5555, 2020 Clinical Nutrition, rsmart@wmaginn.com 1800 444 555

**Patient Instructions:** Take 1.000g (0.001mg) at 2 times in the day, as instructed.

**How to Use ↑**  
Let's Take a Tour →

Print Page

Save Load

Ingredient Name	Bulk Container Size (g)	Bulk Container Price (\$)	Material Density (g/ml)	Target Daily 'Active' Dose (mg)	Total Daily Material Qty (mg)	Total Formula Material Required (g)	Weight Per Dose (mg)	Volume Per Dose (ml)	Cost Per Dose (\$)	
L-Glutamine (Granules)	500	25.00	0.000	3000.000	2000.000	20.000	1000.00	0.20	0.10	
Magnesium Oxide (Granules)	50	25.00	0.000	200.000	1380.000	10.000	400.00	0.80	0.21	
Ascorbic Acid (PB)	500	25.00	0.000	1000.000	4000.000	10.000	500.00	1.40	0.10	
— Select Ingredient —	0	0	0	0	0	0	0	0	0	

Download Formula

**Prescription Label Preview**

**Patient Name:** Jane Doe  
**Patient DOB:** 12 Feb 1976  
**Date:** 01 Jan 2018  
**Duration:** 10 days (10 days)  
**Instructions:** Take 1.000g (0.001mg) at 2 times in the day, as instructed.  
**Prescription:** Take 1.000g (0.001mg) at 2 times in the day, as instructed.  
**Pack Size:** 100.00 doses

**Supplied by:**  
**Warren Maginn**  
Functional Clinical Nutrition  
Dr Robert Smart  
123 Special Street,  
Compoundsville, M555, 2020  
Clinical Nutrition  
rsmart@wmaginn.com  
1800 444 555

**Total Dose Weight (mg):** 1000  
**Total Dose Volume (ml):** 4.01  
**Total Dose Cost (\$):** 0.39

**TOTAL Formula Weight (g):** 10.000  
**TOTAL Formula Volume (ml):** 00.20  
**TOTAL Formula Cost (\$):** 11.75

**Doses in Formula:** 20  
**Dosing Unit:** 0.01g (0.01mg)

**STORE BELOW 20°C - TAKE ONLY AS DIRECTED - KEEP OUT OF REACH OF CHILDREN**

Print Prescription Label Upload Practice Logo (200x100)

Go to: [wmed.link/cc](http://wmed.link/cc)  
(Get Practitioner Access)

# The Fun Part



## Step 5: Prep & Measure

- **Select out Ingredients** from dispensary
- 'Zero' Scales (**calibrate** if nec.)
- **Measure** out each amount  
(listed on the Formula Sheet)
- **Verify** and check each ingredient  
(correct ingredient, correct amount)
- **Add** all ingredients to mixing container  
(start with smallest ingredient/s first - mixing periodically if many)





## Step 6: Blend Formula

### Manual Mixing:

- **Select container** big enough to mix formula evenly  
(general **rule of 10** – i.e. 10x the volume of your final blend)
- Use Alternating **rolling** and **shaking actions**
- **Tumble** ingredients for about **1min per ingredient**  
(until even homogenisation)





# Note on Mixing Densities Together

- Add the Volumes of **each ingredient** in the Formula  
(calculated from **Density Values** in g/ml – by amount used)
- Yields the **Total Volume** of Formula  
(for Picking a suitable dispensing **Container Size**)
- AND the final **dose volume**  
(for picking a serving **Scoop Size**)

## Step 7: Pack and Dispense

- Select suitable **dispensing container** (based on formula's **volume**)
- Position funnel and **pour** formula into container
- **Seal** Container (twist on lid until audible 'click')
- Attach Prescription **Label**
- Supply **Scoop Size** (applicable to dose)  
(calculated from **density** of final formula)



### Tip:

- Add or remove any filler ingredients to arrive at an even scoop size

## Calculator or Master Formula Sheet:

		TOTALS:
		Formula Cost Price (\$)
		Markup (%)
		Final Formula Price (\$)

# Billing

**Your Company Name**  
 Your Company Slogan

**INVOICE**

Street Address  
 City, ST ZIP Code  
 Phone (number) Fax (number)

DATE: \_\_\_\_\_ Date  
 INVOICE # \_\_\_\_\_ 100  
 FOR: \_\_\_\_\_ Project or service description

**Bill To:**  
 Name  
 Company Name  
 Street Address  
 City, ST ZIP Code  
 Phone

DESCRIPTION	AMOUNT
Private Consultation	
Compounded Formula	
Compounding Fee (Optional)	
Tax/GST (exc. Consultation)	
<b>TOTAL</b>	\$ _____

# Summary

## So What Does A Practitioner Need To Do Compounding?

- Qualifications & Association Membership (according to TGA)
- Private Area for Consultations & Compounding
- Equipment, Containers & Raw Ingredients
- Good Procedures (properly written prescriptions and labelling - recorded)
- Willingness to get hands dirty to get results for clients



# Essential Prescribing Competencies

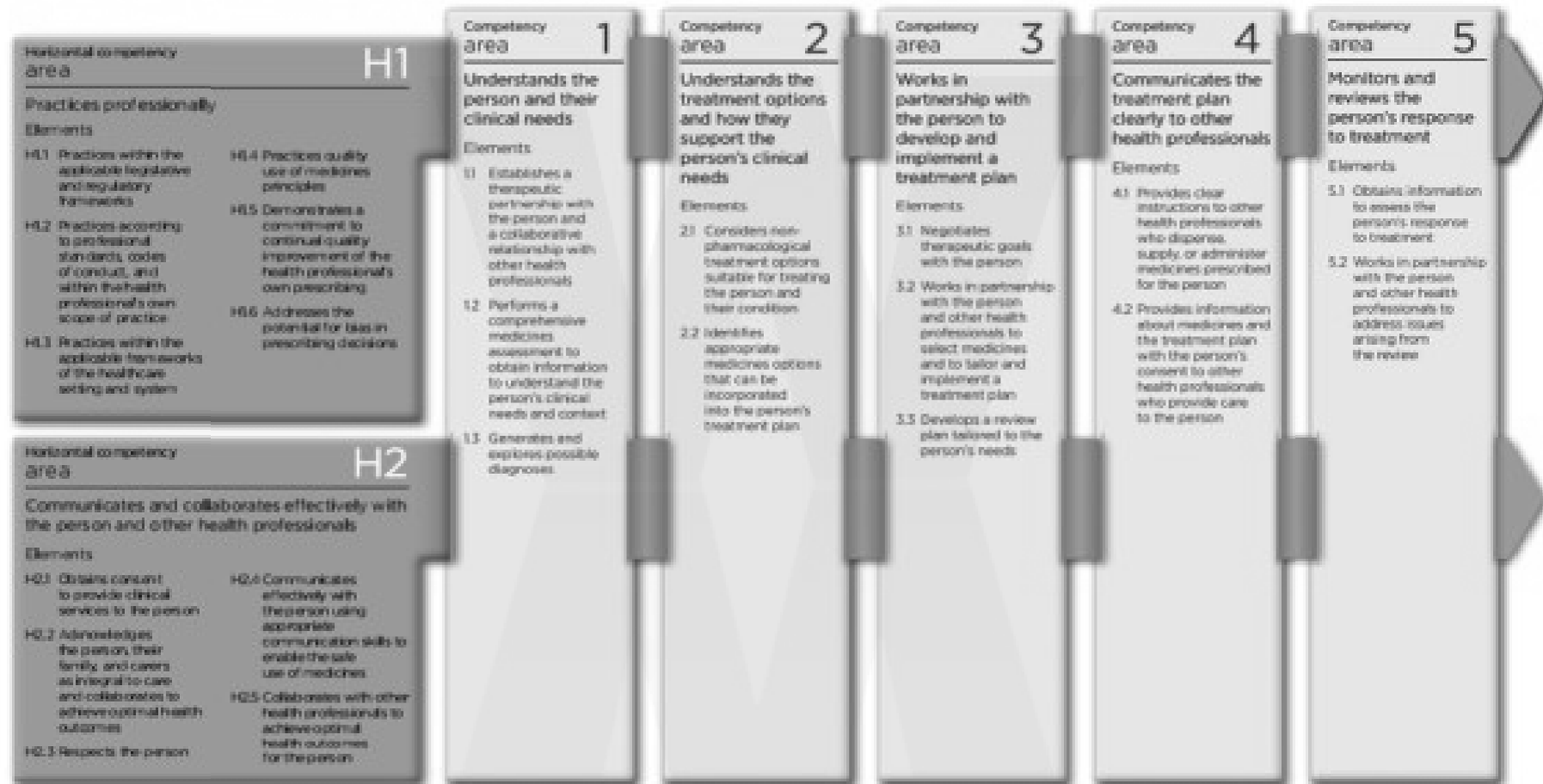
(Practitioner Assoc Guidelines)

## Practitioners Should be able to:

1. Effectively gather specific patient-related information
2. Consider options for treatment and understand their expected risks and benefits
3. Communicate treatment decisions effectively
4. Monitor the prescribed therapy
5. Practice professionally  
(with a clear understanding of their relevant scope of practice)  
(including any personal or professional limitations)



## PRESCRIBING COMPETENCIES FRAMEWORK: COMPETENCY AREAS



Independent, not-for-profit and evidence based, NPS enables better decisions about medicines and medical tests. We are funded by the Australian Government Department of Health and Aged Care.  
© 2012 National Prescribing Service Limited. All rights reserved.







# **Basic Formulations**

Examples To Get You Started

# Nutritional Ingredient Nomenclature

- What does the '**L-**' & '**D-**' mean in a compound's name?  
(e.g. 'L-Glutamine' vs 'D-Mannose')
- What does the '**A-**' mean in a compound's name? (Acetyl or Adenosyl Group)
- What does the '**N-**' mean in a compound's name (e.g. N-Acetyl-Cysteine)
- What does the '**S-**' mean in a compound's name? (e.g. S-Adenosyl-Methionine)
- How are ingredient names **simplified**?  
(Acetyl-L-Carnitine = Acetyl Carnitine = ALC)  
(N-Acetyl-Cysteine = NAC)  
(S-Adenosyl-Methionine = SAME)



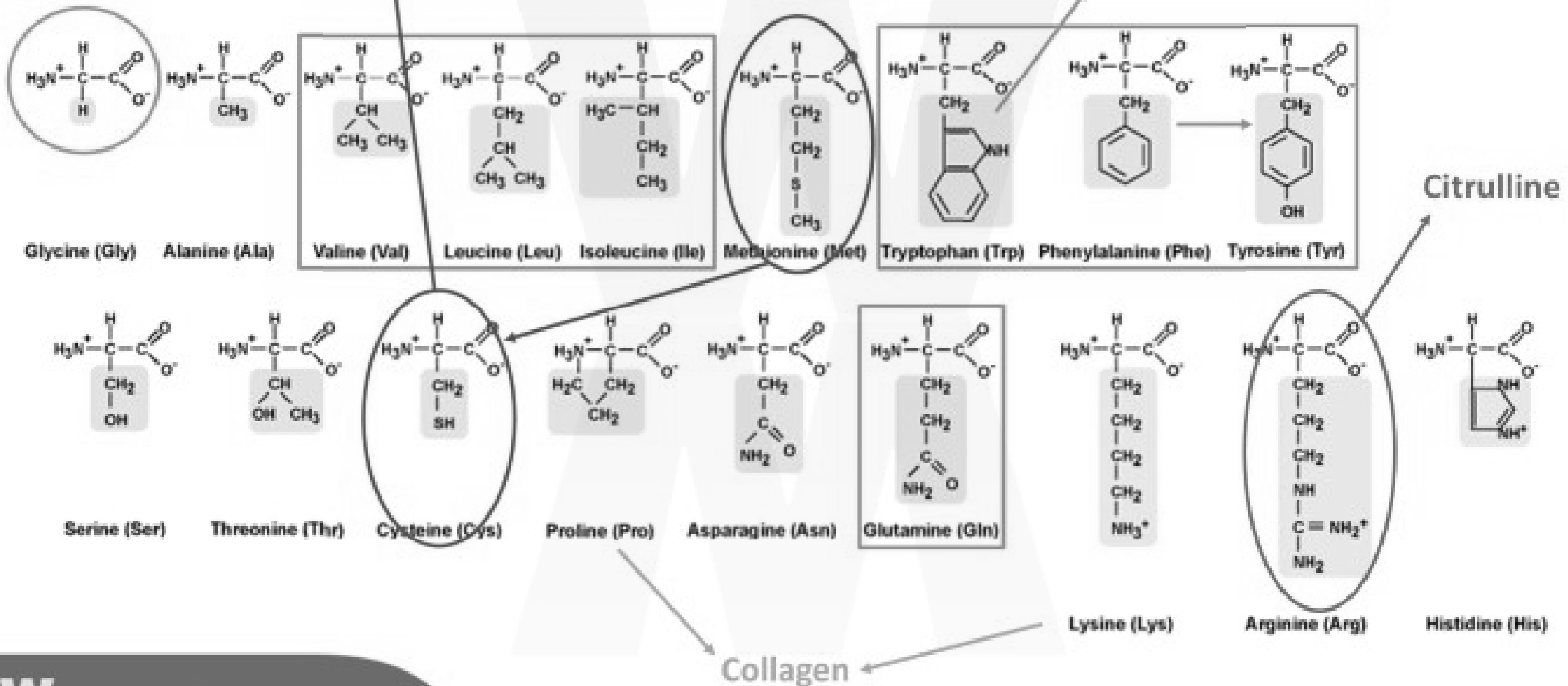
# Amino Acids

# Amino Acids

Taurine

5-HTP

Citrulline

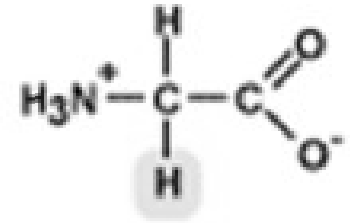


# Glycine

- The **simplest** Amino Acid
- Made from **Serine** in the body (requires Folate)
- **Sweet** taste (non carb)
- Yet increases tolerance to glucose! (consider in **Diabetes**)
- Primary **Neuro-Inhibitor** (in spinal cord)
- Improves **Sleep Quality** (3g before bed)
- **Detoxifies** of benzene (ring) compounds (to Hippurate)
- Thus potentially **phenols** (esp. **Salicylates** – consider in sensitivity)

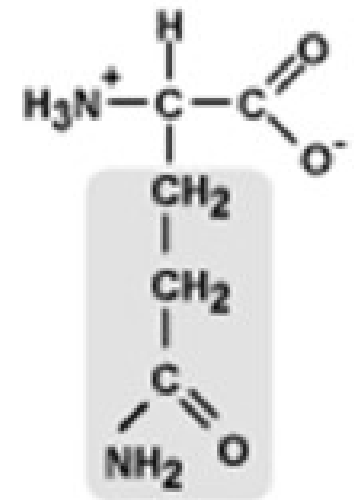
## Doses:

- 1g - 5g p/d for **most** uses (sleep, as sweetener, liver detoxification, etc.)
- 10 - 20g p/d for **high dose** uses (mental health, Growth Hormone boosting, etc.)



# Glutamine

- Most **prevalent** in body (highest need?)
- Protein **Synthesis** (building/healing body tissue)
- Primary fuel of **Enterocytes** (gut lining)
- **WBCs** need it, but can't make it (key to immunity)
- Readily Crosses **BBB**
- Precursor to Glutamate and **GABA** (Excitation & Inhibition)
- Note: A Source of **Ammonia**  
(dividing doses throughout the day advisable – esp in liver dysfunction)



## Doses:

- 1g - 10g p/d for **most** uses (wound healing (surgery/burns), gut, immunity, etc.)
- 10 - 20g p/d for **high dose** uses (focussed gut treatment, athletic uses, etc.)

NCBI Resources How To

PMC  
US National Library of Medicine  
National Institutes of Health

PMC

Limits Advanced Journal list

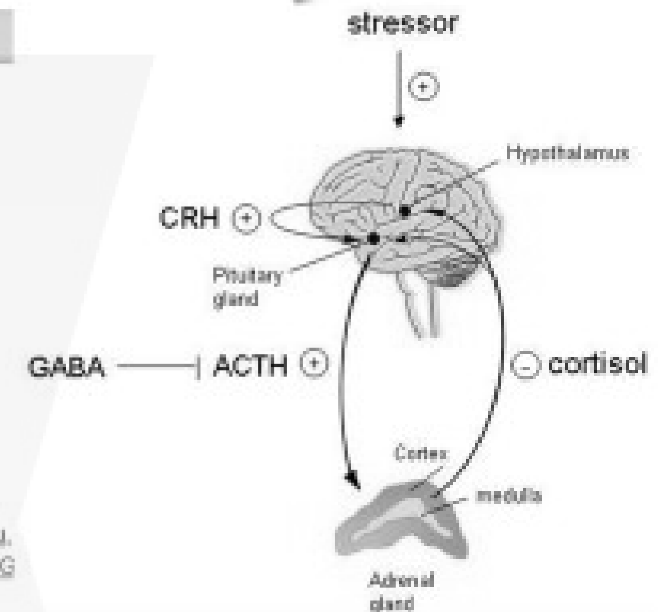
Journal List > Front Pharmacol > v.6, 2015 > PMC4639630

**frontiers**  
in Pharmacology

Front Pharmacol. 2015; 6: 260.  
Published online 2015 Nov 10. doi: [10.3389/fphar.2015.00260](https://doi.org/10.3389/fphar.2015.00260)

**Study of GABA in Healthy Volunteers: Pharmacokinetics and Pharmacodynamics**

Junfeng Li,<sup>1,†</sup> Zhaoyun Zhang,<sup>1,‡</sup> Xiaoxia Liu,<sup>1</sup> Yi Wang,<sup>1</sup> Fei Mao,<sup>1</sup> Junjun Mao,<sup>2</sup> Xiaolan Lu,<sup>1</sup> Yun Wan,<sup>1</sup> Jia-Ying Lv,<sup>3</sup> Guoying Cao,<sup>4</sup> Jing Zhang,<sup>4</sup> Naqing Zhao,<sup>3</sup> Mark Atkinson,<sup>5</sup> Dale L. G Prud'homme,<sup>7</sup> Zheng Jiao,<sup>2,\*</sup> Yiming Li,<sup>1,\*</sup> and Qinghua Wang<sup>1,8,9,\*</sup>



"Our data show that [oral] **GABA** is rapidly absorbed and tolerated in human beings; its **endocrine effects**, exemplified by increasing islet hormonal secretion, suggest potential therapeutic benefits for **diabetes**."

"Importantly, GABA significantly **decreased glycated albumin levels**"

# Acetyl-Carnitine

- Key **Mitochondrial** Cofactor
- **Energy** Production (Fatigue Conditions & Performance)
- **Lipotropic** (Fat Metabolism)
- Liver Detox (Phase II / **Acetylation**)
- Nervous System (**Acetyl Choline** mimetic)
- **Ammonia** Detoxification (via Carnitine)

## Doses:

- 500mg – 3,000mg p/d (for most uses)





# Taurine



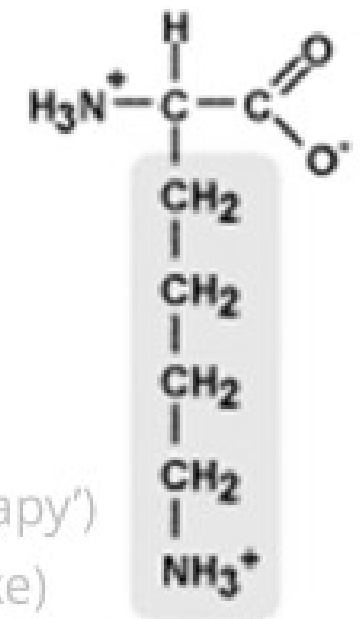
- The '**swiss-army knife**' of amino acids
- Easy **Sulphur** source (palatable and efficient) - (for sulphation)
- **Bile** Synthesis & Phase II (500-1,500mg BID - lipotropic / liver detox)
- Transports **Magnesium** into cells (1g assists Mg supplementation)
- **Glucose** into cells (1-2g BID-TID blood sugar management)
- **Cardiac** Muscle Support (1-3g general support - 5-15g Cardiac Arrhythmias)
- Adrenaline/Neuro-**inhibitory** (1-3g am (anxiety), pm (insomnia), BID epilepsy)

## Doses:

- 500mg – 3g p/d (most uses)

# Lysine

- **Essential** Amino Acid (cannot be synthesised)
- One of the **highest** amino needs (over 2g per day min)
- **Collagen** Synthesis (1-3g with Vit C for Skin, Joints, etc.)
- Inhibits **Glycation** (limits tissue sugar corrosion e.g. in diabetes)
- **Cardiovascular** Support (2-3g protective, 3-6g acutely in 'Pauling Therapy')
- **Antiviral** (Herpes) – (1-3g p/d for **Cold Sores** + minimise Arginine intake)



## Doses:

- 500mg – 3,000mg p/d (for most uses)

**Tolerability:** Well tolerated (NAEL at 25g p/d)

# Citrulline



- **Nitric Oxide** Production (Cardio, Erectile Dysfunction, Asthma, etc.)
- Sports **Performance**, Endurance and Recovery
- **Raises Arginine** (better than Arginine itself!)
- Citrulline, but not Arginine, supplementation can **improve blood pressure**
- Supports **Ammonia Metabolism** (to Urea)  
(use whenever high dosing Glutamine or BCAAs)

## Doses:

- 1-3g (or sometimes double to 6g) per day (for most uses)

(can readily double that again to 12g if needed – well tolerated)

(however divide daily qty into a minimum of 2 doses, 3 preferable)

(take after food/snack - as optimal function in presence of Insulin)

# Tyrosine

- Downstream **metabolite of Phenylalanine**
- Precursor to **Thyroid Hormone** (500mg + Iodine = energy/metabolism regulation)
- Precursor to **Melanin** (skin and hair pigment)
- Precursor to **Dopamine** (mood, concentration, memory – esp. under stress)
- Opiate Withdrawal?
- **Adrenal** Support (500mg – 2g + Vitamin C to prevent Catecholamine Depletion)
- Key Cofactors: **Zn, B6, Mg** (take most efficiently as a Capsule product)

## Doses:

- 500mg – 2,000mg p/d (for most uses)
- 5g – 10g p/d for **high dose** use (60 min prior to acute stressors - inc. exercise)

# DL-Phenylalanine

- L-Phenylalanine = Precursor to Tyrosine (see previous)
- D-Phenylalanine = Obstructs breakdown of endorphins and enkephalins
- **Endorphins** and **Enkephalins** modulate pain perception and mood.
- Supports natural **pain inhibition**  
(Chronic pain conditions – arthritic, peripheral injuries, etc.)

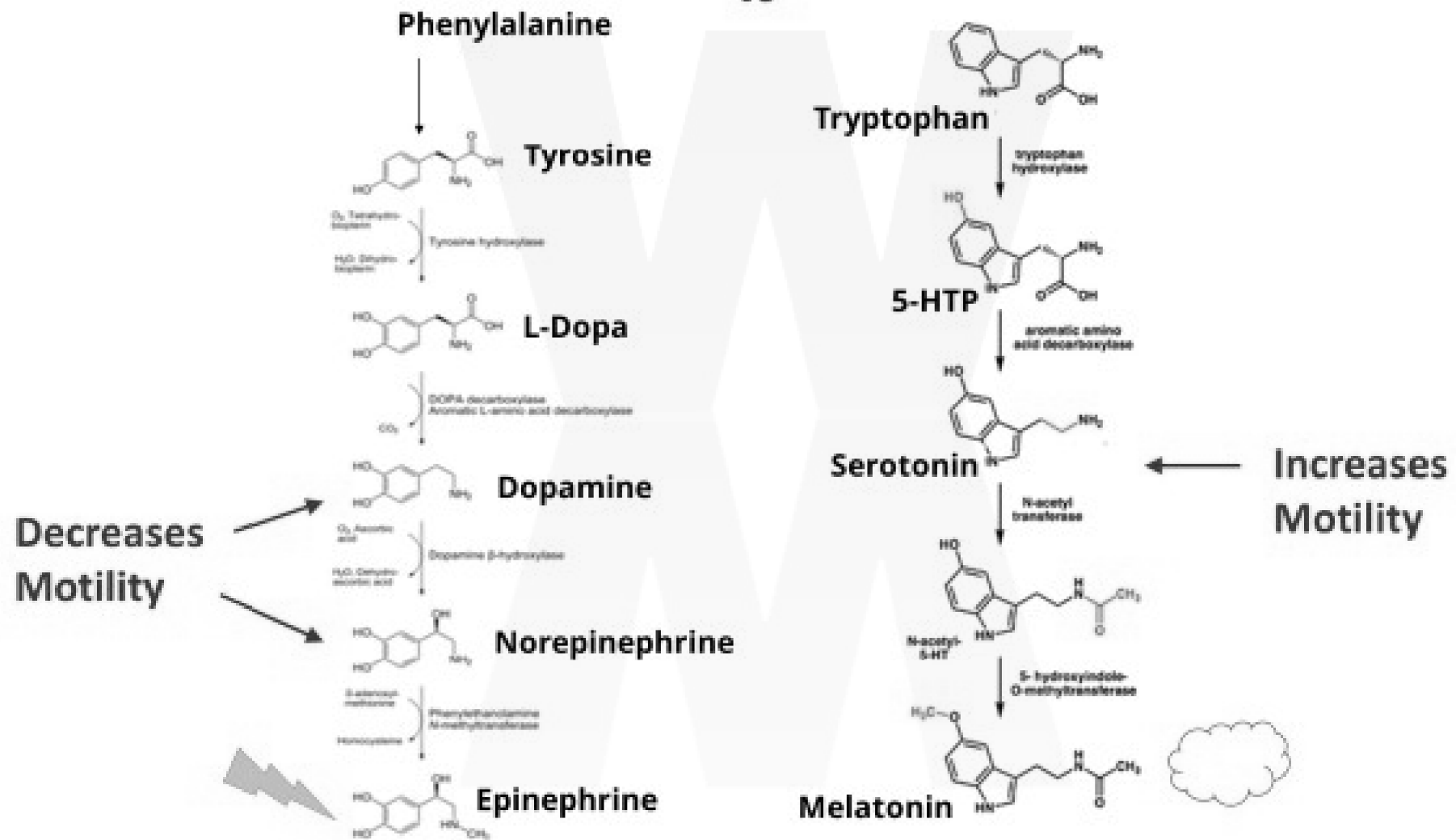
## Doses:

- 100 – 3,000 mg p/d (min. effective - stagger dosing for optimum duration)  
(take 50-100mg of P5P (Active B6) with all long term higher doses of DL-P)

## Dopamine Pathway

Vs

## Serotonin Pathway

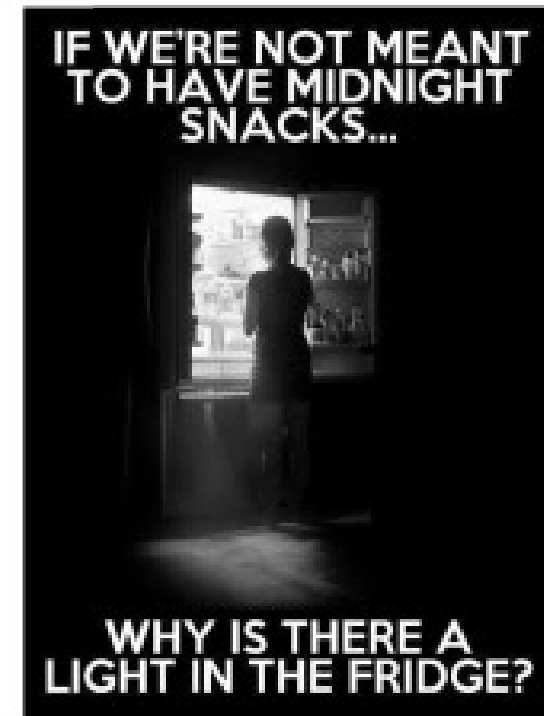


# 5-HTP

- Precursor to **Serotonin** (Why not Tryptophan?)
- **Mood & Motility** (Serotonin)  
(ensure no contraindicated medications)
- **Sleep & Calm** (inc. Melatonin Production)
- **Satiety** (Weight Management and Carb Cravings)  
(esp. on high protein diets)
- **Hormone** Interplay  
(esp. with Estrogen – support HRT, OCP, estrogen imbalances, etc.)

## Doses:

- 50mg – 200mg p/d (as needed)  
(Balance with Dopamine pathway (Tyro/DLP))
- Key Cofactors: **Zn, B6, Mg** (take efficiently as Capsule product)



# Nutraceuticals & Botanicals



# DIM

(Di-Indolyl-Methane)



- **Brassica** Vegetable derivative
- **Indole** metabolite of I-3-C (Indoel-3-Carbinol)
- Preferable in **pure DIM** form (preconverted – most researched – most affordable)
- Supports **Phase I** Detox (encourages 2-OH of Estrogens)
- Assists **CONVERSION of Estrogens** (not excretion)

## Doses:

- 100mg – 300mg p/d

# CDG

(Calcium-D-Glucarate)



- Inhibits Beta-Glucuronidase in gut (detox obstructed by flora)
- **Supports Phase II Detox** (retains hepatic Glucuronidation)
- **Fat-soluble** compounds (Hormones, Vitamins & Toxins) all require Glucuronidation
- Assists **EXCRETION of excess Estrogens** and Toxins

## Doses:

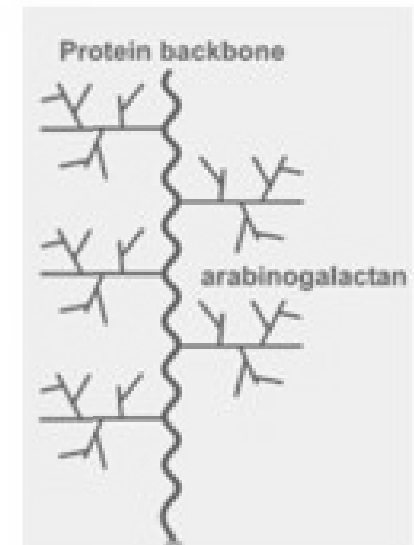
- 500mg – 3g+ (as required for optimal support)  
(hormone testing to confirm balanced estrogen levels may be useful)

# Arabinogalactans

- **Soluble Fibre** from Larch Bark
- Rich in **Proteoglycans** (Source of **GOS**-like Galactose units & better tolerated)
- Palatable & Dissolves Easily
- **Prebiotic**
- May Increase **SCFAs** (Colonic Healing)
- Participates in **Cell Signalling!** (Immune System Regulation)  
(Regulate Gut GALT Tissue Reactivity)
- Increases **Immunity** (resistance to Colds & Flus)
- **Ammonia Detox**

## Doses:

- 500mg – 5g (as required for digestive support – high doses well tolerated)



# Vitamins & Minerals

# Vitamins

Water Soluble		
Vitamin	Cofactor Roles	Daily Dose Ranges
<b>B Vitamins</b> B1, B2, B3, B5	Carb/Lipid Metabolism & Energy Production	5mg - 50mg
B6	NTs, Enzymes, (w Zn, Mg)	50mg - 200mg
Folate B12	Methylation, Energy, Growth	500mcg - 5,000mcg
<b>Vitamin C</b>	Antiox, Conn. Tissue, CVD, GSH, etc...	100mg - 5,000mg

Fat Soluble		
Vitamin	Roles	Daily Dose Ranges
<b>Vitamin A</b>	Immunity & Connective Tissue	500mcg - 3,000mcg
<b>Vitamin D</b>	Immunity & Inflammation	25mcg - 150mcg
<b>Vitamin E</b>	Antioxidant	50mg - 800mg
<b>Vitamin K</b>	Calcium Metabolism & Hormones	50mcg - 250mcg

\* Most Suitable for Powder Use

# Minerals

(Elemental Daily Doses)

## Electrolytes:

- \* • Magnesium (50mg – 800mg)
- \* • Calcium (50mg – 800mg) \* (maintain 1:1 with Mg)  
(with Vitamin K if high dose)

## Trace:

- \* • Zinc (15mg – 150mg)
- \* • Iron (5mg – 50mg+) \* (test first!)
- \* • Copper (2mg - 5mg) \* (test for Zn:Cu first!)
  - Manganese (2mg – 5mg)
  - Molybdenum (50mcg – 1,000mcg+)
- \* • Iodine (250mcg – 2,500mcg+)
  - Chromium (25mcg – 250mcg+)
  - Selenium (25mcg – 200mcg)

## Total Salt

### Note:

Minerals must be bound to other molecules to form a 'total salt' (for stability & absorption).

Many options available:  
(Citrate, Malate, Sulphate, Glycinate, etc.)

So consider **Activity Factor** when planning total mineral salt doses!

- \* Most Suitable for Powder Use
- \* Highly Oxidative (Unstable)

# Simple Combinations

(Examples)

## **Insulin & Blood Sugar:**

- Taurine + Inositol (high dose at 1:2 ratio)

## **Cardiovascular Support:**

- 2-3g Lysine + 5-10g Vitamin C (Pauling Therapy)  
+ Taurine + Citrulline  
(for extra cardiac muscle and NO vasodilatory support - blood pressure)

## **Neuro / Calm Support:**

- Taurine + Theanine + 5HTP (20:2:1 ratio)
- 5-HTP + Tyrosine or DL-Phenylalanine (balance as needed by individual)

## **Digestive Motility / SIBO Support:**

- 5HTP + ACL (Serotonin + Acetyl-Choline motility mediation)

## **Ammonia Detox:**

Citrulline + Carnitine + Arabinogalactans

## **Estrogen Detox:**

DIM + CDG + Methyl Support (B-complex)

# Mixing Commercial Finished Products?

(Absolutely)

- Take any powder formula
- Measure it's density
- Add it as 'single' ingredient to any formula
- To boost it with additional ingredients as desired
- or to blend it with other finished products (for synergy...)



e.g.  
Meal Formula + 5-HTP

## Note:

- Consider the **Active Portion** of Multi-Ingredient Blends as **100%** (as one single active - for ease of calculation and dosing decisions)



# Using Ingredients As Excipients

## Fillers

- Glycine
- Glutamine
- BCAAs
- Arabinogalactans

## Stabilisers

- Ascorbic Acid (Vitamin C)

## Flavours

Food Powders (dried wholefoods and fruit powders)  
Flavour Packs (e.g. calibrated to 10% of formula)

## Sweeteners

Xylitol  
Erythritol  
Glycine  
Stevia



# Monitor, Revisit and Reassess

Keep good records:

- Formulas
- Prescriptions
- Labels

- Get **return visits** for **renewals** of script  
(to monitor progress and adjust formula/s as required)





- **Now Its Your Turn**
- **Get Ready & Jump in!**

(All skills start with practice and play)

# Be Part of Taking The Profession Forward



# Continuing Education (CPE)

Make use of:

- Educational resources, calculators & tools
- Especially helpful for complex compounding processes
- and/or for ingredients/preparation techniques used infrequently



*Presentation Special!*

**90% Discount** on  
'Practitioner Access'  
Membership

(Full Access to ALL Prac Calculators & Resources  
on WarrenMaginn.com for only **\$5!**)

- Simply go to: [wmed.link/pracsignup](http://wmed.link/pracsignup)
- Enter Discount Code: **COMP101**



## Further Resources

- **WarrenMaginn.com**  
for Calculators, Resources & Practice Support  
(Compounding Calculator: [wmed.link/cc](http://wmed.link/cc) )
- **ResearchNutrition.com.au**  
for Equipment, Containers, Ingredients & Product Support (in Aus)
- **Consumer Sites**  
for misc. Clinic Equipment: Scales, Funnels, Tupperware, etc.



*Just*  
**KEEP  
CALM  
AND  
COMPOUND  
IT**