NMDA321
Nutritional Physiology Research

Session 7

Biochemical and Mechanistic Basis of Cell Salt Mineral Therapy

Nutritional Medicine Department
Session 7

- Biochemical and mechanistic basis of cell salt mineral therapy
- History and development
- Cations and anions
- Sodium
- Phosphate
  - Sodium phosphate
- Sulphur
  - Sodium sulphate
- Potassium
- Chloride
  - Potassium chloride
  - Potassium phosphate
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- Calcium
  - Calcium fluoride
  - Calcium phosphate
  - Calcium sulphate
- Magnesium
  - Magnesium phosphate
- Iron
  - Iron Phosphate
- Silica
  - Silica
History and Development

- Dr Schuessler (1821-1898) – German homeopath and doctor who saw minerals as central to the treatment of disease
  
- His rationale was that after cremation of a human body certain minerals remain in the ash
  
- From this identified 12 minerals that were essential to human health an imbalance of any would lead to disease
  
- Minerals in highly diluted homeopathic dosages.

(Blackmores 2012, p.2)
History and Development

- Australian naturopath Maurice Blackmore (1906-1977) agreed with Schuessler in that mineral salts are essential for human health.
- However, believed much stronger doses were needed due to depletion of minerals in our diet as a result of modern agricultural practices leading to depleted soil and food processing as well as poor food choices.
- He took Schuessler’s 12 minerals and omitted sodium chloride, which he felt was in excess in the modern diet due to consumption of processed food etc. (Blackmores 2012, p.3)

History and Development

- Alfred Jacka colleague of Maurice Blackmore
- Treated thousands of patients in his years of practice and co-authored ‘Prescribing Techniques’, a guide to prescribing and utilising mineral therapy
- Attributed Celloids importance to people being mineral deficient due to poor soil as a result of contemporary farming practices
- Like Blackmore argued need for these higher doses than was required in Schuessler’s time

(Jacka & Jones 2012, p iii)
Cations and anions

- Blackmore developed 11 Celloids in cation-anion pairs.
- Combining positively charged cations with the negatively charged anions, e.g. Sodium sulphate ($\text{Na}^+\text{SO}_4^2$)
- Advantage of these cation and anion combinations:
  - Rapid dispersion into the body leading to improved bioavailability
  - Many of the minerals are in the same form as present in the human body, e.g. Calcium phosphate in bones

(Blackmores 2012, p.4)
## Cations and anions

<table>
<thead>
<tr>
<th>Intracellular</th>
<th>Extracellular</th>
<th>Primary Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium (Ca$^{2+}$)</td>
<td>Structure of bone and teeth</td>
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<td></td>
<td>Transmission of nerve impulses</td>
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<td>Hormone release</td>
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<td>Regulation of enzymes</td>
<td>Regulation of enzymes</td>
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<td>Phosphorus (HPO$_2^{-}$, H$_2$PO$_4^{-}$)</td>
<td>Structure of bone and teeth</td>
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<tr>
<td></td>
<td>Energy (as ATP)</td>
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<td></td>
<td>Important for cellular activity</td>
<td>Important for cellular activity</td>
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<td></td>
<td>Intracellular buffer (regulation of acid-base balance)</td>
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<td>Part of cell membrane lipid bilayer</td>
<td>Part of cell membrane lipid bilayer</td>
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<tr>
<td>Sulphur (S$^{2-}$ or SO$_2^{-}$)</td>
<td>Sulphur containing amino acids</td>
<td>Sulphur containing amino acids</td>
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<td>Connective tissue, cartilage and skin (as glycosaminoglycans)</td>
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<td>Detoxification</td>
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<td>Cellular adhesion</td>
<td>Cellular adhesion</td>
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<td>Wound healing</td>
<td>Wound healing</td>
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<td>Potassium (K$^{+}$)</td>
<td>Nerve impulses</td>
<td>Nerve impulses</td>
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<td></td>
<td>Muscle contraction</td>
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<tr>
<td></td>
<td>Osmotic pressure of cells</td>
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(Blackmores 2012, p.12)
## Cations and anions

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<td>Homeostasis of body fluids (with chloride) sodium potassium pump</td>
<td></td>
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<tr>
<td>Chlorine (Cl⁻)</td>
<td>Homeostasis of body fluids (with sodium) component of gastric acid (as HCl)</td>
<td></td>
</tr>
<tr>
<td>Magnesium (Mg²⁺)</td>
<td>ATP and its associated functions</td>
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<td></td>
<td>Muscle relaxation</td>
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<td></td>
<td>Nervous system function</td>
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<td></td>
<td>Structure of bone</td>
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(Blackmores 2012, p.12)
# Celloids and Memory Key

<table>
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<tr>
<th>Celloid</th>
<th>Memory Key</th>
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<tr>
<td>Sodium phosphate (SP)</td>
<td>Metabolic acid balancer</td>
</tr>
<tr>
<td>Sodium sulphate (SS)</td>
<td>Liver function &amp; detoxification</td>
</tr>
<tr>
<td>Potassium chloride (PC)</td>
<td>Congestion remover</td>
</tr>
<tr>
<td>Potassium sulphate (PS)</td>
<td>Chronic infection &amp; inflammation</td>
</tr>
<tr>
<td>Potassium phosphate (PP)</td>
<td>Nerve power activator</td>
</tr>
<tr>
<td>Calcium phosphate (CP)</td>
<td>Cell builder</td>
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<tr>
<td>Calcium sulphate (CS)</td>
<td>Chronic suppurative conditions</td>
</tr>
<tr>
<td>Calcium fluoride (CF)</td>
<td>Connective tissue strengthener</td>
</tr>
<tr>
<td>Magnesium phosphate (MP)</td>
<td>Neuromuscular co-ordinator</td>
</tr>
<tr>
<td>Iron phosphate (IP)</td>
<td>Inflammation remover</td>
</tr>
<tr>
<td>Silica (S)</td>
<td>Calcium re-organiser</td>
</tr>
</tbody>
</table>

(Blackmores 2016)
Prescribing suggestions

- Chronic conditions – typically recommended 1 TDS
- May use more frequently in acute situations
- May be recommended up to 12 per day depending on need, and combination of products used
- More material doses require greater caution around frequency of repetition and potential interactions
- Reduced doses for children and infants
  - E.g. magnesium phosphate ¼ every 5-60 minutes (acute), ¼ once daily (chronic) in infants 2-6 months, halving the dose in under 2 years.

(Jacka & Jones 2013, p. 3)
Sodium

- Sodium major extracellular cation and occurs in high concentrations in the extracellular fluids in the body.
- Low intracellular concentration, maintained by exchange mechanisms with potassium and magnesium (sodium potassium pump).
- Homeostasis of body fluids (with chloride).
- Required in nutrient co-transport systems including transport of glucose and amino acids and various ions.
- Sodium potassium pump helps in proper functioning of nerves and muscles.
- Food sources: dietary salt, vegetables (beet greens, celery, peas, kelp), meat, seafood, diary and fish, bread and cereal foods.

(Blackmores 2012, p.117-118)
Sodium

- Maurice Blackmore believed that sodium compounds were interrelated with every other compound and catalysts.
- *Every prescription* – include one or both sodium compounds for adult chronic conditions.
- The sodium Celloids facilitate minerals to be kept in solution, leading to increased absorption by the tissues.
- Relationship with other minerals
  - Phosphate – acts together with sodium to maintain pH
  - Sulphur – sulphuration of proteoglycans gives negative charge attracting sodium and in turn drawing in water, hydrating the connective tissue

(Blackmores 2016, Blackmores 2012, p. 118)
Phosphorus

- Phosphorus exists in plant and animal foods and biological fluids as phosphate ions
- Exists in inorganic complexes and also organic complexes such as phospholipids (e.g. lecithin)
- Structure of bone and teeth
- Energy (as ATP)
- Important for cellular activity
- Intracellular buffer (regulation of acid-base balance)
- Part of cell membrane lipid bilayer and cell organelles
- Important for nerve transmission and muscle contraction

(Blackmores 2012, p. 106-107)
Phosphorus

- Relationship to other minerals:
  - Calcium is a synergist with phosphorus absorption, phosphorus forms the skeletal matrix and is essential for muscle contraction
  - Magnesium – synergist in phosphorus metabolism, with phosphorus stabiliser in ATP molecule
  - Iron – excess iron may inhibit phosphorous absorption
  - Potassium – synergist in phosphorus absorption
  - Sodium – synergist in phosphorus absorption, maintenance of urinary pH

(Blackmores 2012, p. 106-108)
Sodium phosphate

- **Memory key:** Metabolic acid balancer

- **Major actions**
  - Helps to maintain pH (phosphate effective buffer)
  - Vital role in urinary and digestive systems
  - Facilitates removal of metabolic acids such as lactic acid

- **Indications**
  - Gastrointestinal:
    - Gastric acidity
    - Dyspepsia
    - Intestinal parasites (over acid bowel creates environment for parasites)

(Blackmores 2016, Blackmores 2012, p.148, Jacka & Jones 2012, p 2.15)
Sodium phosphate

- Indications cont…
  - Musculoskeletal:
    - Facilitate removal of metabolic acids such as lactic acid (enhance athletic performance)
    - Arthritis including osteoarthritis, rheumatoid arthritis, gout (reduce uric acid)
    - Fibromyalgia

(Blackmores 2016, Blackmores 2012, p.148, Jacka & Jones 2012, p 2.11 & 2.15)
Sodium phosphate

- Indications cont…
  - Epithelial tissues:
    - Itching (urticaria)
    - Burning and cystitis
  - Conditions characterised by sour acidic sweat and other discharges
    - Candida albicans
    - Itchy skin associated with liver and gallbladder dysfunction.

(Blackmores 2016, Blackmores 2012, p.148, Jacka & Jones 2012, p 2.11 & 2.15)
Sodium phosphate
Diagnostic guides

(Blackmores 2016)

Thin weak nails

(Blackmores 2016)
Sodium phosphate
Diagnostic guides

Tongue: White or yellow cream coloured coating (especially creamy at the back)

Exudations: Creamy, honey or golden yellow

(Blackmores 2016, Blackmore 2012, p 56)
Sulphur

- Sulphur containing amino acids (cysteine and methionine important sulphur source)
- Contributing strength, elasticity and hydration to connective tissue, cartilage and skin (as glycosaminoglycans)
- Wound healing
- Detoxification – sulphur renders metabolites more water soluble for urinary excretion, sulphuration of bile salts increases solubility making easier for excretion
- Cellular adhesion – as component of glycocalyx (glycoprotein) important part of plasma membrane

(Blackmores 2012, p 120)
Sulphur

- Relation to other minerals
  - Calcium with sulphate meditates cellular adhesion to the extracellular matrix and to other cells by attaching sulphate groups to polysaccharide chains
  - Phosphorus competes for sulphur for reabsorption in the kidney
  - Potassium – glycoproteins and glycolipids on the cell membrane associated with potassium
  - Sodium with sulphur act to maintain fluid balance in connective tissue
Sodium sulphate

- **Memory key**: Problem fluid remover
- Liver function & detoxification
- **Major actions**
  - Assists detoxification
  - Sulphate renders metabolites more water-soluble for urinary excretion
  - Sulphation of bile salts increases their solubility in water in turn increasing renal and faecal excretion
  - To regular bile viscosity and flow through gall bladder
  - Maintain fluid balance in connective tissue

(Blackmores 2012, p 149)
Sodium sulphate

- Indications
  - Detoxification
    - Heavy metal accumulation
  - Gastrointestinal:
    - Hepatoprotective (congested liver, heavy metal detoxification)
    - Gallstones
    - Biliousness and nausea
    - Pancreatic support – insulin production
  - Fluid balance: Sodium and sulphate act together to maintain fluid balance in connective tissue
    - breast tenderness as a result of fluid
    - fluid retention around arthritic joints

(Blackmores 2012, p 149, Jacka & Jones 2012, p 2.16)
Sodium sulphate Diagnostic guides

Tongue
- Serrated or scalloped edge
- Clear, shiny, no coating
- Colour other than cream
- Greenish/brown coating – heavier at rest

(Blackmores 2012, p 149, Jacka & Jones 2012, p 2.16, Jones 2008)
Sodium sulphate
Diagnostic guides

Nail
- Pale and frosted
  Note: not the bed of the nail but the actual nail is pale and frosted)

Exudations
- Yellowish-green
  e.g. mucus

(Jones 2008)
Potassium

- Major intracellular cation
- Enzyme activation e.g. sodium potassium pump, pyruvate kinase (magnesium also needed)
- Effect on growth - influences the uptake of amino acids into the cells
- Maintain normal osmotic pressure and water balance
- Important for nerve function (stress may lead to potassium deficiency)
- Regulation of neuromuscular excitability and stimulation
- Correct balance of potassium and calcium ions needed for rhythmic contraction of the heart - when potassium is depleted susceptible to arrhythmia. Also, influence on blood pressure (potassium inhibits the release of renin thereby causing vasodilation)

(Blackmores 2012, p. 111-112)
Potassium

- Relationship to other minerals
  - Calcium – Increasing potassium intake reduces urinary calcium excretion and causes a positive calcium balance
  - Chlorine – lost in urine in conjunction with potassium
  - Magnesium deficiency often co-exists with potassium deficiency
  - Sodium – high sodium increases need for potassium
  - Sulphur – glycoproteins and glycolipids are associated with potassium

(Blackmores 2012, p. 111-112)
Chloride

- Extracellular anion assists in the regulation of cell volume via chloride channels that can influence the uptake or loss of water by cells.
- Chloride channels needed for cell volume regulation, membrane transport, stabilisation of resting membrane potential, signal transmission and pH regulation of intracellular organelles.
- Mutation of the gene effecting chloride channels can lead to genetic disorders including cystic fibrosis.
- Chloride ions component of gastric juice.
- Food sources: sodium chloride (table salt) in processed foods, spring water, chloride also found in some vegetables and fruits.

(Blackmores 2012, p. 90-91)
Chloride

- Relationship to other minerals
  - Potassium along with chloride is essential for the production of gastric acid. Also involved in the KCl co-transport system in kidney tubules
  - Sodium and chloride essential for the generation of the membrane potential and the proper firing of nerve and muscle cells. Both minerals involved in production of membrane secretions in the lung, intestine and pancreas. Chloride ions needed to recover sodium in the kidney

(Blackmores 2012, p. 90-91)
Potassium chloride

- **Memory key:** Congestion remover
- **Major actions**
  - Removes congestive matter
  - Involved in gastric acid production
- **Indications**
  - Inflammation and redness
    - Second stage inflammation with congestion (e.g. colds, flu, tissue injury or trauma). Often with iron phosphate
    - Infection with discharge – especially white or greyish white (e.g. tonsillitis/mastitis)

(Blackmores 2012, p. 144)
Potassium chloride

- Indications
  - Congestions and tissue overgrowth
    - Lymphatic congestion e.g. swollen lymph nodes and cystic acne. Easing lymphatic congestion will in turn improve fluid retention.
    - Respiratory conditions with stringy white mucus (e.g. bronchitis).
  - Catarrh
  - Conditions of tissue overgrowth (fibroids, cysts, warts)
  - Gastrointestinal
    - Underactive digestive complaints as involved in production of gastric acid
    - Hypochlorhydria
    - Mouth ulcers

(Blackmores 2012, p. 144, Blackmore 2012, p 60, Jacka & Jones 2012, p. 2.9)
Potassium chloride
Diagnostic guides

Tongue
• Coating white/greyish-white, frothy mucus
• Coating clean/dry
• Coating clear, slimy, watery
• Pale
• Swollen

Exudations
• White or greyish-white from mucous membranes

Nails
• Long and narrow
• Humped over and talon-like

(Blackmores 2016, Jones 2008)
Potassium phosphate

- **Memory key: Nerve power activator**
- **Major actions**
  - Major intracellular cation and anion
  - Promotes nerve impulses connection the central nervous system to motor nerves
  - Enzymes and cofactors in metabolic pathways

(Blackmores 2012, p 145, Blackmores 2016, Jacka & Jones 2012, p. 2.10)
Potassium phosphate

- Indications
  - Conditions of physical, mental and nervous exhaustion
  - Decreased nerve based energy
  - Low mood, despondency
  - Fatigue and weakness
  - Poor memory and concentration
  - Children who are slow learners and have poor memory
  - Hypersensitivity to noise, glare, stimuli
  - Convalescence
  - Impaired digestion (promotes nerve supply)

(Blackmores 2012, p 145, Blackmores 2016, Jacka & Jones 2012, p. 2.10)
Potassium phosphate
Diagnostic guides

Nail
- Usually long and narrow
- Humped over and talon-like (see also potassium chloride & potassium sulphate)

Tongue
- Dry
- Mustard colour

(Blackmores 2016, Jones 2008)
Potassium sulphate

- Memory key: Chronic infection or inflammation
- Major actions
  - Strong association with mucopolysaccharides and glycoproteins – both of which are important components of skin, cartilage and the cell coat
  - Vital in oxidative processes in the cytochromes = cellular metabolic energy
  - Closely associated with the structural integrity of the cell
  - Production and repair of cell coats
  - Stabilisation of the cytoplasmic matrix and cell-to-cell adhesion

(Blackmores 2016)
Potassium sulphate

Indications

- Chronic infection and inflammation
  - 3rd stage of infection and inflammation
  - Chronic or recurrent low-grade conditions (e.g. viral, bacterial, fungal infections)
  - Chronic yellow-green mucopurulent discharge

- Oxygenation
  - Fuzzy head, desire for fresh air, excessive yawning, sighing
  - Useful wandering pains due to insufficient oxygenation in arthritis

(Blackmores 2016, Jacka & Jones 2012, p. 2.11)
Potassium sulphate

- Indications cont…
- Desquamation of skin
  - Dry flaky skin conditions such as psoriasis, eczema, dandruff
  - Yellow green exudation from skin
  - Fungal infections of skin and mucus membranes

  (Blackmores 2016)
Potassium sulphate
Diagnostic criteria

Nails
• Thickened/distorted
• Pitting (like pin pricks on nail surface)
• Humped over and talon-like
• Yellowing of nail
  (Blackmores 2016, Jones 2008)
Potassium sulphate
Diagnostic criteria

Tongue
• Yellow
• Slimy
• Glutinous and sticky

Exudations
• Yellow or yellow-green from skin or mucous membrane

(Blackmores 2016)
Calcium

- Structure of bone and teeth
- Transmission of nerve impulses
- Hormone release
- Regulation of enzymes
- Muscular and cardiovascular systems – cardiac muscles are dependent on both extra- and intracellular calcium for contraction. Heart requires the right balance of potassium and calcium for rhythmicity
- Urinary system – increased calcium intake may reduce kidney stone incidence by half
- Pregnancy – maternal bone health, foetal growth and development

(Blackmores 2012, p 85-87)
Calcium

- Calcium in relation to other minerals
  - Fluoride – lends strength to bone and teeth
  - Iron – effect Ca absorption long term
  - Magnesium – hypocalcaemia can result from Mg deficiency
  - Phosphorous – high intake enhances secretion of parathyroid hormone and results in lowering of blood Ca
  - Potassium – Ca administered intravenously to reduce effects of high blood potassium
  - Silica and Ca in bone development
  - Sodium – dietary intake determinant of urinary Ca excretion, increase in sodium increase in Ca excretion
  - Sulphur – components of cartilage along with Ca

(Blackmores 2012, p 85)
Calcium fluoride

- **Memory key - Connective tissue strengthener**
- **Major actions**
  - Integrity and strength of connective tissue such as bone, ligament, tendon, cartilage & tooth enamel
  - Fluoride plays a role in the mineralisation of teeth & the crystalline structure of bone
  - May stimulate proliferation & activity of osteoblasts

(Blackmores 2016)
Calcium fluoride

Indications

- Musculoskeletal
  - Prolapse of connective tissue (intestinal, uterine, intervertebral disc, hernia)
  - Stimulate the proliferation of osteoblasts
  - Mineralisation of teeth and bone
  - Imperfect of defective teeth enamel
  - Flat feet and fallen arches
  - Reoccurring injuries e.g. hamstrings, twisted ankles

(Blackmores 2016, Blackmores 2012, p. 135)
Calcium fluoride

- **Indications cont…**
- **Gastrointestinal**
  - Conditions involving lack of integrity of gastric mucosa
  - Prolapse and displacement of gastrointestinal tissue (e.g. hernia and intestinal prolapse)
  - Elastic tissue strengthener of sphincter muscles
  - Receding gums
- **Epithelial tissue**
  - Cracks or fissures of epithelial tissue (e.g. cracked heals or cracks in corner of mouth)
  - Stretch marks
  - Excessive wrinkling
  (Blackmores 2016, Blackmores 2012, p. 135)
Calcium fluoride

- Indication cont...
- Vascular
  - Varicose veins and haemorrhoids
  - Valves
  - Decreased elasticity and dilatation in the venous system
- Reproductive System
  - Uterine prolapse
  (Blackmores 2016, Blackmores 2012, p. 135)
Calcium fluoride
Diagnostic guides

Nail
Cracked skin around the nail bed
Cracked and split

(Blackmores 2016, Blackmores 2012, p. 135)
Calcium fluoride
Diagnostic guides

Tongue
• Cracked appearance
• Mapped appearance
• Chronic swelling and hardening
• Coating, clay coloured

(Blackmores 2016, Blackmores 2012, p. 135, Jones 2008)
Calcium fluoride
Diagnostic guides

- Exudations
  - Bloody, purulent (also indicates Iron phosphate)
  - Putrid smelling; from ulceration, pungent (also indicates Silica and Potassium phosphate)
  - Yellow tough lumps
  - Stuffy, ozaena – a chronic disease of the nose characterised by a foul smelling nasal discharge and atrophy of nasal structures

(Blackmores 2012, p. 135)
Calculated phosphate

- **Memory key: Cell builder**
- **Major actions**
  - Vital component for muscle function
  - Calcium is necessary for normal nerve function
  - Calcium is required for all cell reproduction in general including RBC production
  - A constituent of bone and teeth

(Blackmores 2016)
Calcium phosphate

Indication

○ Cell development and growth
  • Periods of rapid growth (childhood, adolescence and pregnancy especially from second trimester)
  • Calcium essential for maternal bone health and foetal growth, development and lactation
  • Slow growth or failure to thrive in children

○ Nervous system
  • Anxiety
  • Irritability
  • Poor appetite (esp. children)

○ Children
  • Slow or imperfect dentition, teething
  • Irritability

(Blackmores 2016, Blackmores 2012, p 137)
Calcium phosphate

- Indication cont…
- Musculoskeletal
  - Essential bone and teeth
  - Essential for normal muscle function
  - Cramping pain (dull, worse for pressure / worse for cold)
  - Spasms and cramps worse at night
  - Twitching and spasms of the eyelids
- Epithelial tissue
  - Eczema
  - Skin pigmentation e.g. vitiligo
- Respiratory system
  - Lung tissue integrity

(Blackmores 2016, Blackmores 2012, p 137)
Calcium phosphate
Diagnostic criteria

Nail
• White spots (also consider silica or zinc)
• Soft or pliable nails
• Peeling and/or flaking at end of nail

(Blackmores 2016)
Calcium phosphate
Diagnostic criteria

Tongue
• Small red spots at edge of pale coated tongue (strawberry tongue)
• Blisters on tip (also indicates potassium chloride)

(Blackmores 2012, p 138, Blackmores 2016)
Calcium sulphate

- **Memory key:** Chronic suppurative conditions

- **Major actions**
  - Constituent of ‘intercellular cement’ and also acts on electrostatic bridge where tight junctions are required
  - Aids wound healing
  - Calcium is required for the reproduction of epithelial cells

(Blackmores 2016)
Calcium sulphate

- Indications
  - Chronic suppurative conditions
    - Chronic, long-standing or suppurative stages of infection & ulceration associated with liver dysfunction
    - Thick, lumpy, yellow, purulent mucus & discharge (often with blood)
    - Abscesses, boils and carbuncles
    - Acne especially lumpy due to blood and pus under skin
    - Persistent leucorrhoea
    - Ears discharging for weeks and months e.g. children

(Blackmores 2012, p 139)
Calcium sulphate

- Indications cont…
- Wound healing and tissue erosion
  - Excessive desquamation of the skin or mucous membranes e.g. skin ulcers
  - Bedsores
  - Lack of healthy granulation and poor wound healing

(Blackmores 2012, p 139-140)
Calcium sulphate
Diagnostic guides

- Limited distinct diagnostic guides for this Celloid.
- Tongue – sometimes clay coloured
- Nail – ulcerated (also indicates Silica)

- Exudations
  - Thick lumpy purulent mucus and discharge
  - Blood streaked mucopurulent discharge or catarrh
  - Greyish-white
  - Yellow, blood flecked mucus

(Blackmores 2012, p 139-140)
Magnesium

- Intracellular functions
  - ATP and its associated functions – concentration of Mg in mitochondria is high
  - Regulates operation of ion channels and transport mechanisms - critical role in secondary messenger system
  - Cellular enzyme activation e.g. ATPase
  - Maintains proper conformation of nucleic acids and proteins
  - Modulates oxidative phosphorylation of the Kreb’s cycle

(Blackmores 2012, p 101-103)
Magnesium

- Muscle relaxation
- Nervous system function – modulates nerve excitability and neuromuscular transmission, reduces excitability of neurones
- Cardiovascular function – e.g. enzyme reactions in cardiac cell
- Structure of bone – Mg involved in parathyroid function

(Blackmores 2012, p 101-103)
Magnesium

- Relationship to other minerals
  - Calcium – Mg deficiency effects the control of calcium ions, hypocalcaemia major complication of moderate to severe Mg deficiency
  - Phosphate and Mg needed many aspects of cell metabolism
  - Potassium – Mg deficiency effects the homeostatic control of potassium ions
  - Sodium – Mg deficiency effects sodium ion balance
  - Zinc – increase in Zn intake can decrease Mg absorption and balance significantly

(Blackmores 2012, p 101-103)
Magnesium phosphate

- Memory key: Neuromuscular coordinator
- Major actions
  - Important for energy production – necessary for the proper utilisation of phosphate in the storage & release of energy from ATP
  - Essential for neuromuscular function
  - Relaxant for neuromuscular activity

(Blackmores 2016)
Magnesium phosphate

- **Indications**
  - Energy production and neuromuscular activity
  - Nervous system
    - Tremor, twitch, spasm
    - Tension at the back of the neck that leads to headache
    - Headaches with a band like sensation
    - Irritability
  - Migraine
  - Neuralgia
  - Sciatica
  - Pain – sharp, shooting, stabbing - shifting pain (also Potassium sulphate)
  - Confusion
  - Insomnia
  - Cramp
  - Hyper excitability
  - Sensitive to light

(Blackmores 2012, p142)
Magnesium phosphate

- Indications cont…
  - Musculoskeletal
    - Essential nutrient for normal muscle function
    - Cramp, spasm, twitch (e.g. twitching eyelids)
  - Cardiovascular
    - Abnormalities in the condition and activity of cardiac muscle
  - Female reproductive system
    - PMS (tension & cramp)
  - Gastrointestinal system
    - Colic
      - Constipation as a result of stress or a thin stool associated with spasm
  - Respiratory system
    - Spasmodic cough without expectoration

(Blackmores 2012, p 142)
Magnesium phosphate
Diagnostic criteria

Nail
- Clubbing (like an inverted soup spoon)
- Short & very round

(Blackmores 2016, Jones 2008)
Magnesium phosphate
Diagnostic criteria

- Tongue
  - Short
  - Quivers
  - Shakes

(Blackmores 2016)
Iron

- Intracellular
  - Constituent of haemoglobin
  - Iron is present in the cytochrome enzymes of the mitochondria in all cells
  - Cells contain iron-activated enzymes e.g. catalases, peroxidases
  - Iron is essential for biochemical reactions in normal cell function
  - Iron needed for DNA synthesis and therefore growth

- Infection and wound healing

(Blackmores 2012, p. 96-97)
Iron

- Muscular and cardiovascular systems
  - Haemoglobin in red blood cells as an oxygen carrier
  - Myoglobin in muscle as an oxygen store in active muscles
  - Transferrin which transports iron from the intestines into the bloodstream
  - Ferritin storage iron form

- Pregnancy
  - Maternal blood volume is increased during pregnancy and iron is necessary for increased production of maternal haemoglobin
  - Indicated for iron deficiency anaemia

(Blackmores 2012, p. 96-97)
Iron

- Relationship to other minerals
  - Calcium inhibits the absorption of non-haem iron especially if eaten within the same meal
  - Copper – high intakes of iron can interfere with absorption of copper
  - Phosphate – acts as a regulator for the absorption of iron, forms part of ferritin the iron storage part
  - Zinc – iron competes for absorption
  (Blackmores 2012, p. 98)
Iron phosphate

- **Memory key:** Inflammation remover
- **Major actions**
  - Iron is a prime source of cellular energy via transport of oxygen in haemoglobin
  - Involved in RBC production
  - Storage of oxygen in myoglobin – phosphate in ATP associated with iron
  - Oxidation-reduction in the cytochromes – cytochromes need iron for their function

(Blackmores 2016, Blackmores 2012, p 141)
Iron phosphate

- **Indications**
- **Inflammation and infection**
  - 1st stage of inflammation and infection (e.g. colds, flu & fever etc.) commonly prescribed with Potassium chloride
  - Acute tissue conditions such as due to accidents or injury
  - Inflammation present in any tissues e.g. stomach, bowels, skin, muscle etc.
- **Circulatory system**
  - Nutritional iron deficiency anaemia with associated symptoms like listlessness, fatigue, breathlessness & pallor
  - Hypotension

(Blackmores 2016, Blackmores 2012, p141)
Iron phosphate
Diagnostic criteria

Nail
- Flat on top with square edge
- Thin, weak and upward curl (dish-like)

(Blackmores 2016)
Iron phosphate
Diagnostic criteria

Tongue
Bright red and beefy

Exudations
• Clear from mucus membranes
• Bloody purulent/pus (also Calcium fluoride)
• Offensive yellow crust

(Blackmores 2016)
Silica

- Structural framework of connective tissue - integral component of collagen, glycosaminoglycan's and their protein complexes (proteoglycans).
- Infection and wound healing – silica positively influences fibroblast enzymes such as collagenase and cross-links connective tissue
- Initiation of bone growth and bone mineralisation
- Relationship to other minerals
  - Calcium – silica is necessary for the early stages of bone development for the subsequent deposition of calcium salts (Blackmores 2012, p 115)
Silica

- **Memory key**: calcium reorganiser
- **Major actions**
  - Essential constituent of connective tissue – collagen, elastin and reticular fibres
  - Involved in early stages of bone development

  (Blackmores 2016, Blackmores 2012, p 147)
Silica

- **Indications**
  - Musculoskeletal
    - Conditions affecting bones, tendons, ligaments & cartilage
    - Degenerative conditions of connective tissue e.g. arthritis particularly osteoarthritis
    - Abnormal nutrition and calcification of bone, tendon, ligament and cartilage e.g. bone spurs
  - Detoxifying – drives wastes outwards

(Blackmores 2012, p 147)
Silica

- **Indications**
  - Teeth -Strengthens tooth enamel
  - Skin
    - Promotes expulsion of foreign materials such as glass or splinters
    - Promotes suppuration & initiates healing
    - Ripens skin conditions - abscesses, boils, styes, blind pimplies
  - Hair and nails - strengthening

(Blackmores 2012, p 147)
Silica
Diagnostic criteria

Clinical sign:
• Excessive perspiration, especially the extremities (feet) and if there is strong odour

Nail
• Poor condition
• Raised ridges running lengthways (sometimes beaded)
• Thick brittle/chipped nails
• Split lengthways

(Blackmores 2016)
Silica
Diagnostic criteria

**Tongue**
Long and pointed (arrow-like)

(Blackmores 2016)
Tutorial
Clinical Findings:

- 7 years ago the client went to the doctor for a Pap smear and breast check and asked for referral for mammogram and ultrasound. The client insisted and she was diagnosed with breast cancer.
- Breast cancer stage 2 - 12 mm and 3 lymph nodes. Removed right breast and was given a chemo and radio.
- She was 2 years on Tamoxifen and now on Arimidex for 4 years.
- Skin got worse after the cancer treatment.
- Didn’t tell her family about the cancer
Tutorial

- GIT: had polyps in the large intestine which were removed about 1 year ago, burned out.
- Bowel: every day, dark brown, they sink. Feels chubby and bloats with some take away food. These symptoms worsened after chemo.
- Sleep: insomnia predominant - can stay up until 4am with worry, stress, family, work, kids. After dinner very tired, feels very tired and sleepy, goes to bed and falls asleep 9.30pm to 12am. Wakes at 12am and then doesn’t fall asleep until 2, 3 or 4 am, gets up 6.30am. Can fall asleep at work.
- Migraine once every 2 months, takes panadol. She says it feels like sinus and a very sharp pain behind the left eye.
Tutorial

- Exercise - 30 min every day, pilates, walk, activity tape, anything for ½ hour.
- Pathology: TSH - 3.14
- Zinc Tally: salivary no taste
- Tongue: coated with slight yellowish colour
- Nails: talon like with some ridging
Tutorial

Diet:

- **Breakfast** - 175 ml yogurt - Vaalia low fat natural, 2 tbs linseeds, 2 tbs pumpkin seeds, 1 tbs sesame seeds and 1 tbs sunflower seeds.
- **MT** - handful nuts.
- **Lunch salad** - lettuce, carrot, tomatoes, onion, smoked salmon - every day 100 grams or 2 whole eggs, or 60 grams cheese, Coon or light cheese.
- **Dinner** - big, steamed veg, zucchini, broccoli, cauliflower, rarely pasta, whole meal bread 2 slices, salmon grilled or fried in pan with olive oil spray. Meat twice a week. Once a week or every 3 weeks Chinese or Thai take away.
- **Water not a lot** - 2 or 3 cups a day.
- **Coffee** 2 cups black or skim cap in am + water.
- **Tea** - with milk skim.
Tutorial

- Consider how you would use mineral therapy to treat this client with the Celloids you have learned so far.
- What Celloid(s) would you choose?
- Write down the dosage instructions for the client.
- Would you use other nutritional supplements to support the mineral therapy treatment?
Tutorial

- Consider how you would use mineral therapy to treat this client.
- What Celloid(s) would you choose? Write down the dosage instructions for the client.
- What Celloid would you use to remove the pus?
- What Celloid would you use to cleanse the tissues?
- Would you use other nutritional supplements to support the mineral therapy treatment?
Tutorial

- **Follow-up and Outcomes**
  - Phone call 3 days later: client indicated that she went to the toilet and it started to drain, she’s feeling a lot better.
  - Consider if your mineral therapy prescription would now change?

- Consult 2 months later: has been feeling good, she’s looking well, same diet. Sleeping 8 hours. Exercise walking \( \frac{1}{2} \) hr 4 days a week. Pap smear result is normal.

- Consider your ongoing mineral therapy prescription for this client now including preventative prescription if shaving her genitals.
Tutorial – Case 2

- Female child, 2 years old

- Presenting concerns:
  - Dry cough, becoming worse at night
  - Fever of 38.5°C with flushed cheeks
  - Very distressed, crying
  - Diminished appetite since having the fever - the child was not taking much in the way of fluids
Tutorial

- **Past history:**
  - Hospital admission for bronchiolitis when 6 months old
  - Reflux as a baby
  - Recurrent sore throats and ear infections
  - Prone to dry coughs in winter
  - Vaccination: up-to-date

- **Family history:**
  - Father – allergic rhinitis and allergy to dust mites and wine (often associated with breathing difficulties)
  - Two older siblings who suffered similar problems in the past - recurrent coughs, sore throats and ear infections
Tutorial

- Consider how you would use mineral therapy to treat this child.
- What Celloid(s) would you choose?
- How would you address the child’s acute symptoms with your choice of Celloid(s) and frequency of dosing?
- Write down the dosage instructions for the mother to administer to her daughter?
Tutorial

- Third visit (2 weeks later - 4 weeks after first consult)
  - The child had completely recovered and was happily symptom-free.
  - Now consider - how would you support this child with mineral therapy over the Winter months?
References

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