MedNut Mail

The How, When, Where, Which and Why of pharmacotnutrition

Potential pharmaconutrition research topics 2

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https://medicationsandnutrition.online

Commentary

In the early 1990s a Canadian research team was investigating whether alcohol interacted with nifedipine/felodipine and unexpectedly found that the effects of these drugs were altered by concurrent intake with grapefruit juice - this was a seminal finding. Three questions arise from this finding

1. what ingredient or ingredients caused the response in the grapefruit-drug interaction?
2. which other foodstuffs alter drug effect? and
3. which other drugs are affected by foodstuffs?

Now, in the early twenty twenties these questions essentially remain unanswered.

Because the cytochrome P450 pathway was identified as being key to the grapefruit juice-nifedipine/felodipine interaction, seemingly the research has focussed on physiological transporters at the expense of drug-food interactions.

More topics for those looking for research projects -

1. Clarification as to whether sorbitol containing medications do alter glycaemic control – either positively or negatively;
2. Identification of the drugs that alter gut microflora and clarification as to whether this effect can be modified by foodstuffs;
3. The vitamin K content of foods is an issue for people on warfarin. There is a recommendation that people taking warfarin maintain a consistent dietary intake of vitamin K, however apparently there is no reliable Australian data to support this recommendation. American data seems to be the basis for dietary advice given to patients and this may not be relevant to Australian foods. What is the vitamin K content of Australian foods?
4. Interactions between medications and trace elements, including the ultra-trace elements, and especially chromium.
5. As some drugs interact with oestrogens, should dietary phyto-oestrogen intake be considered and should there be a stable daily intake?
6. Interactions between anticoagulant drugs and omega-3 fatty acids, and the impact on coagulation pathways, and whether the interactions are additive or synergistic.

7. Should dietary sources of salicylates be considered and potentially intake stabilised in those who do not tolerate pharmaceutical doses of salicylates?
8. the effects of topical medications, whether creams, inhalants, pessaries, patches, etc, on nutritional factors with regard to both active ingredient(s) and excipients.

There are so many different areas about which we have very limited knowledge – what action will you take to add to this body of knowledge?

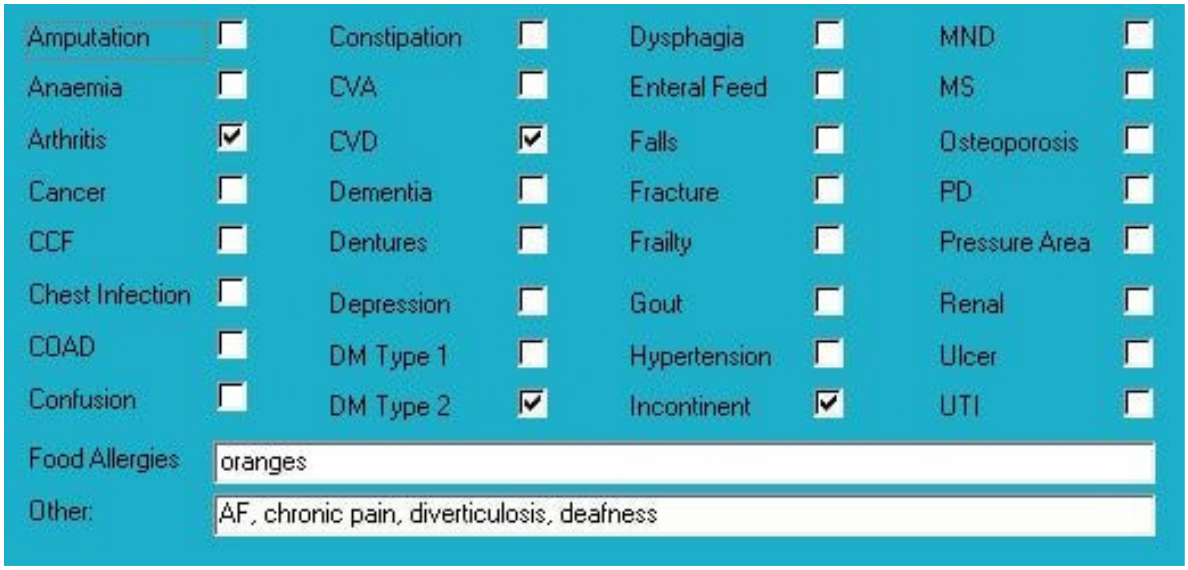
- commence an Honours, Masters or PhD with a project based on one of these topics,
- employ a Research Assistant to conduct literature reviews and publish as a collaborative project,
- collaborate with a number of colleagues to create and fund projects with particular relevance to your area of clinical practice.

Conclusion

As the research in this area becomes more extensive and readily available and accepted, then the inclusion of drug-food and drug-nutrient interactions will be of strategic significance in the ongoing management of those requiring long term administration of medications.

Case study

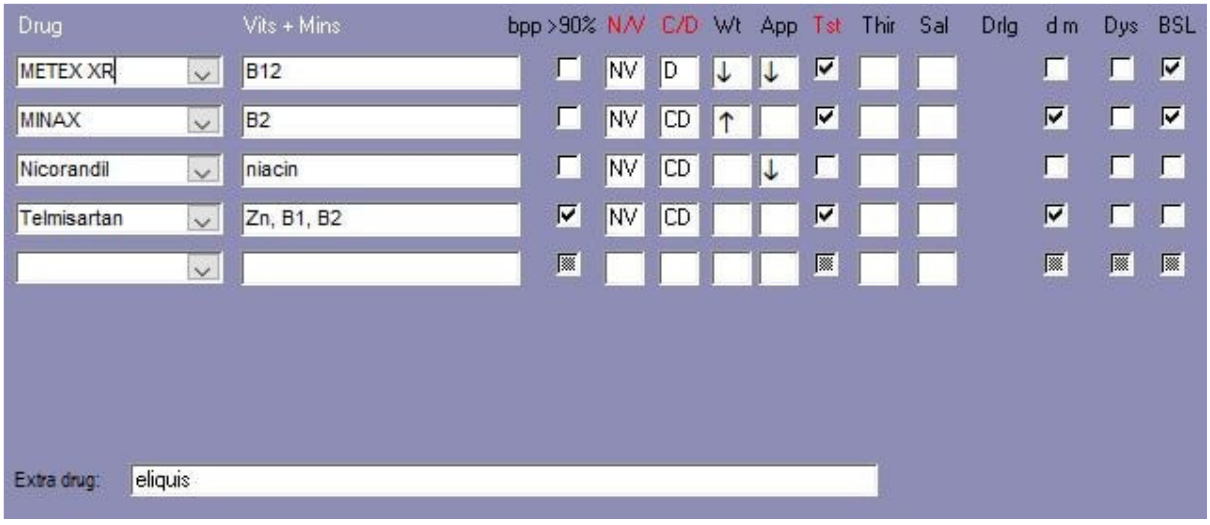
Medical History with Nutritional Aspect



Biochemistry with Pharmaconutritional Consequences

No recent relevant data available

Medications That May Adversely Affect Nutritional Status



Comments – medication and nutrition impacts (direct and indirect) only

No recent relevant biochemistry available. Advisable to check plasma proteins (albumin, total proteins) as markers of nutritional status. The plasma proteins are the primary transporters for one of the prescribed drugs and hypoproteinaemia may alter its effects including expression of its side effects.

Diabetes drugs

- Metex XR has a duration of 24 hours

Diabetes drugs coverage

- before breakfast BSLs - minimal, if any, coverage from previous morning's metformin XR

- before evening meal BSLs - covered by current morning's metformin XR

Metex decreases B12 and thiamine availability, however duration of prescription is unknown therefore advisable to check B12 and thiamine levels.

Annual measurement of B12 levels of those prescribed longterm metformin has been recommended since the 1970s.

Annual injections of 1 mg B12 is also recommended for those prescribed longterm metformin therapy.

At increased risk of thiamine and choline deficiencies as Metex XR, Minax and telmisartan inhibit, and metformin and telmisartan are substrates for, their physiological transporters therefore interventions recommended, and advisable to administer either one hour before or 2 hours after their (drugs) administration

Metformin substrate for the major carnitine transporter OCTN – it is likely longterm metformin prescription may negatively impact carnitine status (carnitine is important in transporting fatty acids into the mitochondria and the transporting garbage out of the mitochondria).

Mrs AAL's diagnoses include chronic pain - nutritional factors that may be useful to consider in pain management include -

- **B12** - low B12 exacerbates elevated TNF- α which is an inflammatory response marker, elevation of the inflammatory response can include a pain response; currently prescribed metformin therefore advisable to check B12 status. There is disagreement between pathology ranges and research findings with regard to appropriate B12 levels - neuro-imaging research found changes to brain structure and function once B12 levels < 300 pmol/L, and recommend B12 interventions once levels are less than 300 pmol/L.

- **Thiamine** – the evidence in increasing that thiamine may have a role in pain management either alone or in combination with B12 and pyridoxine.

Given Mrs AAL is prescribed 3 medicines that inhibit thiamine uptake, it is likely one or more are inhibiting thiamine uptake by the ear hair follicles which in turn exacerbates her deafness.

What else would you include?

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