Regional Public Health
Better Health For The Greater Wellington Region

PUBLIC HEALTH POST

Public Health for Primary Care in Wellington, Wairarapa and the Hutt Valley

Also available online at www.rph.org.nz

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SUGAR-WEIGHT?

It's sugar versus fat and both are winners

New Zealand researchers at the University of Otago recently completed a large systematic review and meta-analysis of randomised controlled trials, showing that increased or decreased intake of sugars resulted in parallel changes in body weight.

For decades dietary fat has been targeted as the principle culprit in the fattening of populations and the resulting rise of related health problems.

Nutritionists have struggled to provide convincing evidence that sugar is also a significant contributor, despite the intuitive link and some high profile expert warnings.

More than 40 years ago British physiologist John Yudkin published 'Pure White and Deadly' claiming an association between high sugar consumption and heart disease. This was not well received by the sugar industry and the idea did not gain traction for more definitive research by the scientific and medical communities. The result was a worldwide focus on fat intake.

Te Morenga et al found that reduced intake of dietary sugars was associated with a 0.8kg (95% CI 0.39 – 1.21kg; $p<0.001$) decrease in body weight, and an increase in dietary sugars was associated with a 0.75kg (95% CI 0.3 – 1.19kg; $p=0.001$) weight increase. These trials involved no strict control of food intake. Participants were advised to increase or decrease sugar containing foods or drinks and their actual intakes were required to be reported in the studies to meet the inclusion criteria. Studies eligible for inclusion in this review were 30 of 7895 trials and 38 of 9445 cohort studies.

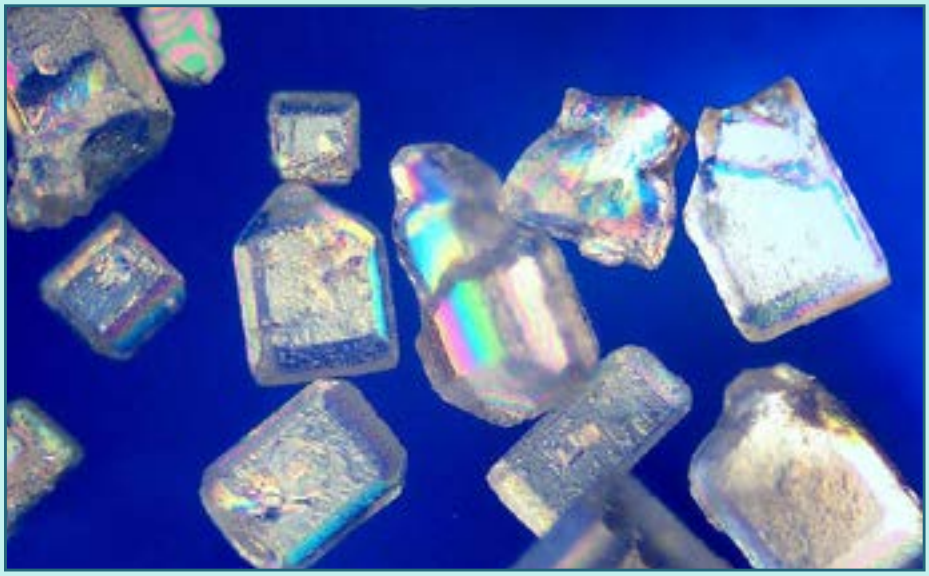

Photo: sugar crystals, Jan Homann, http://commons.wikimedia.org/wiki/File:Zucker_150_fach_Polfilter.jpg

Some studies involving children did not show the effect hypothesised to be due to poor dietary compliance.

Studies which involved replacing dietary energy intake from sugar with energy from other carbohydrates resulted in no significant change in weight. This suggests that sugar is only a part of the problem.

Time to weight gain

The majority of studies that looked at increasing dietary sugars had an end point at 8 weeks. Two studies with an end point greater than 8 weeks resulted in a larger weight gain (2.73 kg, 95%CI 1.68 to 3.78kg) compared to the pooled less than 8 week studies (0.52 kg, 95%CI 0.14 to 0.89kg). This suggests that continuing high sugar intake results in continuing weight gain.

In the studies of reduced intake of dietary sugars, the end point weight was measured between 10 weeks and 8 months after the start of the intervention. There was a longer time for equivalent weight loss compared with weight gain. The reasons for the time differences in weight gain versus weight loss raise another interesting research question.

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Plausible and statistically significant

One kilogram of fat contains the equivalent of 37 000 kilojoules of energy. If all of the energy in food and drinks consumed was absorbed by the body, then to gain 0.52kg in 8 weeks, an average excess of 344kJ per day would need to be consumed.

344kJ is not hard to find. There are approximately 675kJ in one 375mL can of soft drink and 40 – 60kJ per teaspoon of sugar.

This simplistic calculation illustrates that the gains in weight identified by Te Morenga et al associated with excess sugar intake are highly plausible and statistically significant.

Confusing units of energy:

For anyone else who has managed to get through science education, medical school and years of clinical practice, while remaining confused about units of energy used when discussing diet and exercise, here is a quick reminder:

Kilojoules (kJ) are the standard international unit for energy. Calories are another unit of energy, widely used in the food and diet worlds.

Calories with a capital 'C' are not the same as calories with a lower case 'c'. There are 1000 calories in every Calorie. One Calorie is equivalent to 4.2 kJ

Most discussions about energy intake and weight loss that do not use kilojoules refer to Calories with a capital 'C'.

Message for primary care

The significance of these findings for primary care is the reminder that addressing sugar consumption is a key part of interventions regarding weight loss. This is in addition to targeting other unnecessary high energy parts of peoples' diet including fatty foods.

This is not a new message and most general practitioners and primary care nurses will already be advising their patients to reduce sugar consumption where this is relevant to the patients' health.

The difference is that now we have strong evidence to support our intuition and advice.

Sources:

1. Willett WC and Ludwig DS. Science souring on sugar. BMJ 2013;346:e8077
2. Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: systematic review and meta-analyses of randomised controlled trials and cohort studies. BMJ 2012;345:e7492 doi: 10.1136/bmj.e7492 (Published 15 January 2013)
3. http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Kilojoules_and_calories-explained
4. http://liveto100.everybody.co.nz/nutrition/tips-to-gain-weight

Competing interests: the author, Dr Jonathan Kennedy is a family member of one of the study authors for reference 2.

LEGIONELLOSIS IN WELLINGTON

Legionella bacteria are ubiquitous in our environment. As we learn more about the fascinating ecology of this genus with 56 species (21 cause human infection), we are finding increasingly more diverse habitats.

The bacteria are important causes of community-acquired pneumonia. Most cases are sporadic. *Legionella* can cause an influenza-like non-pneumonic disease (Pontiac fever) which is very rarely diagnosed, pneumonia (Legionnaires' disease), occasional extra-pulmonary disease, and even sub-clinical infections.

Legionellosis is still a relatively rare disease. In New Zealand 159 cases of legionellosis were notified in 2011.

This is a rate of 3.6 per 100,000 population. Most were hospitalised and four people died. In 2011 the highest age specific rates were in the 70 years and over (12.5 cases per 100 000 population, 51 cases) and 60-69 years (11.5 cases per 100000, 48 cases) age groups. Rates also vary by ethnicity, highest in the 'European or Other' (4.4 per 100000 population, 133 cases) followed by Pacific (3.0 per 100000, 8 cases) ethnic groups. In the Greater Wellington region four people were notified with Legionellosis in 2011 compared with eight in 2012, one of whom died (the person had serious underlying co-morbidities).

Past or current heavy smoking, heavy alcohol intake, underlying comorbidities such as cancer, chronic lung disease, diabetes mellitus, or renal disease, and other immunodeficient states, including corticosteroid use, are all risk factors for infection.

Symptoms

The symptoms displayed by a person with pneumonic legionellosis are indistinguishable from other causes of atypical pneumonia. Legionellosis typically presents acutely with anorexia, malaise, myalgia, headache, and fever; abdominal pain and diarrhoea are also common. Pneumonia is accompanied by an often non-productive cough. Chest x-ray may show patchy or focal areas of consolidation or bilateral involvement. The illness can be quite severe and may progress to respiratory failure. The pneumonia does not respond to beta-lactam antibiotics alone or in combination with aminoglycosides. Effective antibiotic treatment should be advised by the Infectious Diseases team and may include fluoroquinolone antibiotics or macrolides.

Laboratory tests

Specialised laboratory methods are needed to diagnose legionellosis. The gold standard is isolation of *Legionella* species from respiratory secretions, lung tissue, pleural fluid or blood, but this is rarely attempted. If the infection is caused by L. *pneumophila* serogroup 1, this may be detected by urine antigen test, although the test is not completely specific.

Serology is the mainstay; (1) a four-fold or greater rise in IFA titre against Legionella species to ≥256 between paired sera, or (2) two convalescent phase sera tested in parallel, using species-specific antigen and validated reagents, giving elevated Legionella titres ≥512. Confirmatory serological testing by ESR's Legionella Reference Laboratory is essential. Finally, demonstration of Legionella species antigens in lung tissue, respiratory secretions, or pleural fluid may be attempted. Identification of the species of Legionella responsible for an infection greatly assists in trying to identify and control a source of infection.

Water sources

In nature *Legionella* is ubiquitous, living intracellularly in various species of protozoa that provide habitats in aquatic biofilms for environmental survival, proliferation, and dissemination. From these habitats *Legionella* species can spread easily to colonise a wide range of engineered water reticulation systems, such as domestic plumbing and showers, spa pools, swimming pools, cooling towers and evaporative condensers, hospital warm water systems, decorative water features, etc. Several species may contaminate such man-made systems but in New Zealand L. pneumophila is the predominant one. Susceptible people become infected by inhaling colonised water aerosols.

Soil sources

In 2011 the most common *Legionella* species that were laboratory-reported were *Legionella longbeachae* (41.9% of cases) and L. *pneumophila* (30.6% of cases). L. *longbeachae* is a natural inhabitant of soils and is widely found in commercial potting mixes and composts as well as home-produced composts. Unlike L. *pneumophila*, L. *longbeachae* causes infections when contaminated dry aerosols are inhaled. This can occur when bags of commercial product are unsafely opened or people are exposed to massive wind-blown soil particles from road works or at landfills. All commercial products carry health warnings and advice on safe use. This advice is not always followed.

Identified species in local notified cases

In 2012 Regional Public Health investigated eight cases of Legionellosis in the Wellington, Hutt Valley and Wairarapa region. The infecting species were: five *L. pneumophila*, two L. *longbeachae,* one *L. michdadei* (another predominantly soil species).

Public health follow-up depends on species:

The public health follow-up of legionellosis is usually straight-forward for infections caused by *L. longbeachae* and other soil species. Cases may recall high risk exposures to commercial potting mixes and composts, or to wind-blown soil.

However, it is often very difficult to find the source of sporadic *Legionella pneumophila* infections. Investigation involves the triad of epidemiological, environmental, and microbiological methods. Homes, workplaces, large buildings visited, and the environments around such places are scrutinised for potential aerosol sources. Water samples and swabs are taken from any suspect sources and sent to ESR's Legionella Reference Laboratory for analysis. Environmental isolates can be compared with clinical isolates by genotypic analysis.

Cooling towers on commercial and industrial buildings periodically would be closely reviewed if a cluster of legionellosis occurred . To date

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there have not been any clusters of Legionellosis that have been linked to a cooling tower in Wellington, Wairarapa or the Hutt Valley.

The Wellington City Council maintains a register of where nearly 100 cooling towers are located, particularly in the Central Business District. Most cooling towers in NZ provide air conditioning to buildings and most are covered under the building warrant of fitness (WOF). The NZ Building Code Handbook contains model compliance schedules that include mechanical ventilation and air conditioning systems. This involves complying with standards that require monthly testing for *Legionella* in water cooling towers.

Building owners are required to notify the Medical Officer of Health if testing reveals that a certain level of *Legionella* has been exceeded. Cooling towers outside the building WOF, such as those associated with a manufacturing process, are covered under the Health and Safety in Employment Act 1992 and are expected to comply with certain parts of the standards.

The international literature continues to report new potential sources for aquatic *Legionella* species. Some examples include vehicle wash systems, dental surgery drill water lines, wash basin units, room humidifiers, medical devices containing water (e.g., respiratory care devices), water coolers, ultrasonic mist machinery in supermarkets, and marina water blasters.

Sources:

1. Regional Public Health, Health Protection Officer, Dr Quentin Ruscoe.
2. Episurv - ESR database of notifiable conditions, accessed March 2013.
3. ESR Surveillance Report April 2012. Notifiable and other diseases in New Zealand 2011.
4. Heymann DL, 2008. Control of Communicable Disease Manual 19th edition
5. Ministry of Health Communicable Disease Control Manual 2012
6. The Prevention of legionellosis in New Zealand. Guidelines for the control of Legionella bacteria. NZ Ministry of Health. Revised October 2012.
7. Cooling tower image: http://www.thermalcare.com/assets/images/plantWide/cooling-towers.jpg (this image used as an illustration only and has no known link to legionellosis cases).

INTERNATIONAL: POLIO NOT QUITE BEATEN

Recent attacks on polio vaccination health workers in Pakistan and Afghanistan by militants [1] are a reminder of the difficulties faced in the global effort to eliminate polio infections worldwide. This comes as the Global Polio Eradication Initiative came close to, but missed, its target milestone of stopping all wild poliovirus transmission globally by the end of 2012.

The motivations behind the attacks are likely to be complicated. Some people with status in Pakistan and elsewhere say the polio vaccine is a western plot to sterilise Muslims to stop population growth. Blurring of the lines between foreign intervention and health work have also occurred. Resistance to vaccination is especially strong in Pakistan, where a backlash against immunisation for polio and other diseases has followed the reported use of a fake vaccination programme to close in on Osama bin Laden in 2011.

Polio continues to cause major morbidity and mortality. One in 200 infections leads to irreversible paralysis, and of those paralysed there is a 5-10% mortality from respiratory paralysis.[2]

There are only 3 polio endemic countries left globally: Afghanistan, Nigeria and Pakistan, and all are implementing emergency action plans to achieve eradication. Polio-free countries need to guard against reintroduction of wild poliovirus from the areas still affected.[3]

The following table illustrates the number of cases recorded worldwide in 2012, including those in non-endemic countries:

Countries	Total Cases reported in 2012
Pakistan	58
Afghanistan	37
Nigeria	121
Chad	5
Niger	1
TOTAL	222

Table 1. Worldwide Polio Cases 2012 [4]

The international programme to eliminate polio is the 'largest-ever internationally-coordinated public health effort in history'.[2] It is headed by national governments, WHO, Rotary International, the US Centers for Disease Control and Prevention (CDC) and UNICEF, and has high profile sponsors. A network of more than 20 million volunteers worldwide have collectively immunised more than 2.5 billion children over the past 20 years.[2]

For those interested, the World Health Organisation has excellent resources about polio and polio eradication, available at the references listed below.

Sources:

1. http://www.wpro.who.int/immunization/news/rcc18_poster_exhibition/en/index.html
2. http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx
3. http://www.guardian.co.uk/world/2012/dec/18/polio-vaccination-workers-shot-pakistan
4. http://www.who.int/features/factfiles/polio/facts/en/index.html

WHAT ARE YOU REPORTING?

Notifiable Condition	Number of cases (confirmed cases only)			
	Hutt	Wairarapa	Wellington	Total
Campylobacteriosis	53	13	120	186
Cryptosporidiosis	3	2	22	27
Dengue fever			1	1
Gastroenteritis - unknown cause			1	1
Gastroenteritis / food-borne intoxication	5		4	9
Giardiasis	6	5	35	46
Hepatitis A			2	2
Hepatitis C	1			1
Invasive pneumococcal disease	2	3	7	12
Lead absorption	1	3	6	10
Legionellosis			1	1
Listeriosis		1		1
Malaria			2	2
Meningococcal disease	1		1	2
Pertussis (probable in brackets)	51 (14)	29 (16)	80 (32)	160 (62)
Salmonellosis	8	4	20	32
Shigellosis	1			1
Tuberculosis disease - new case	3		3	6
Tuberculosis disease - relapse or reactivation			2	2
VTEC/STEC infection			2	2
Yersiniosis		1	10	11
TOTAL	135	61	319	515

Table 2. Regional Notified Cases 1/12/2012 to 28/2/2013

Notes:

1. Overall pertussis case numbers are showing signs of decreasing. This is continuing to be monitored to determine if the decrease is a short-term dip or a more long term trend.
2. Campylobacter cases were more numerous compared to the three months to September 2012 (186 vs 114) consistent with expected seasonal trends.
3. No new rheumatic fever cases were reported in this three month period (compared to 4 new cases in the three months to September 2012).

Sources:

1. ESR. Episurv database of notifiable diseases, accessed 25/03/2013.
2. Regional Public Health case notes.

REGIONAL LEAD POISONING 2012

Regional Public Health received notification of 38 cases of lead absorption in 2012.

Most were men, in the 30-59 year old age group. Exposure to lead in the workplace is a common cause, such as painter decorators who breathe in paint dust when preparing older houses, or workers in battery recycling plants. Hobbies, such as small bore rifle shooting also pose a risk as lead fumes from the bullet or primer can be inhaled. A whole blood level of greater than 0.48μmol/L from environmental exposure is notifiable to the Medical Officer of Health.

The diagnosis of lead poisoning can be difficult with symptoms being non-specific and variable; they include abdominal pain, nausea and loss of appetite, mood and behavioural changes and difficulty concentrating. Pregnant women are a particular concern as raised blood lead levels can harm a developing fetus.

What happens when a notification is received by RPH?

Dr Jill McKenzie, Medical Officer of Health outlines the process and rationale which follows the Ministry of Health Guidelines for Investigation and Follow-up of Lead Poisoning (insert link):

> *'All notifications of lead absorption are followed up by one of our team.'*
>
> *'We make contact with the person to check for any potential sources of lead exposure. It is important that even when the most likely exposure is easily identified, such as occupational exposure in a painter-decorator,to identify any other potential exposures such as a hobby that also exposes them to lead. Once potential sources are identified we provide advice about how to reduce levels of exposure.'*
>
> *'It is also important to ensure that no one else is at risk of exposure to the same source. For example, children or others in the home can be exposed to lead through work clothes covered in lead paint dust coming into the home.'*

Health Protection Officer Vanessa Young describes the type of public health advice they discuss with cases:

> *'We provide advice about reducing exposure, but also advice about nutrition (to aid in reducing their blood lead levels), good work techniques such as stripping lead based paint and clean up - where lead based paint has been removed and flakes and dust have contaminated indoor and outdoor areas. We also have advice for specific hobbies and jobs such as small bore rifle shooters, lead lighters.'*

Public Health Staff offer education about potential health effects of lead exposure and can advise families or affected groups about a plan to reduce the risk of further exposure. It is preferable that repeat blood tests are arranged by the medical practitioner but Public Health Staff are able to provide recommendations about follow-up testing based on the Ministry of Health guidelines. Public Health Staff may also recommend testing of other potentially exposed individuals.

Direct laboratory notifications

Across New Zealand, public health units are receiving an increasing proportion of notifications through the direct laboratory notification (DLN) system, and fewer notifications direct

Not a likely source of lead poisoning in New Zealand: Roman lead pipes from the Rhone River. Photo: Ad Meskens http://commons.wikimedia.org/wiki/File:Arles_loden_buizen.jpg

from clinicians. The direct laboratory notification system is effective for communicating notifications and a great 'safety net', but does not have vital clinical information that is needed to follow-up the patient and ensure they receive the best care. For this reason, Regional Public Health asks that general practitioners and practice nurses continue to notify cases even if they may already be notified through the DLN system.

For lead poisoning and other hazardous substance injury cases, notification can be done easily by using the BPAC electronic notification form in MedTech 32. It is a short form and the blood test result can be attached from your Inbox.

Further information about electronic notification is available here http://www.rph.org.nz/content/b22b0af9-caf0-40fc-a642-1a6d2077baf6.html or on the RPH website under Health Professionals, Notifiable diseases. Cases can also be notified by phone on (04) 570 9267 or fax (04) 570 9373.

Practice points

- Lead poisoning is not uncommon in our region – consider the diagnosis when risk factors are present
- RPH contacts all notified cases and provides important information about reducing exposure.
- Remember to notify RPH when the blood lead level is over 0.48μmol/L, clinical detail is important for follow-up and not included in direct laboratory notifications. An electronic notification form is available through BPAC.

Sources:

1. Dr Saira Dayal, Public Health Medicine Registrar, Centre for Public Health Research, publichealth.massey.ac.nz
2. Regional Public Health

YEAR IN REVIEW – 2012 NOTIFIABLE CASES

Notifiable Condition	Number of cases (confirmed cases only)			
	Hutt	Wairarapa	Wellington	Total
Campylobacteriosis	170	73	440	683
Cryptosporidiosis	34	16	113	163
Dengue fever	1		9	10
Gastroenteritis - unknown cause			2	2
Gastroenteritis / food-borne intoxication	23		26	49
Giardiasis	50	20	132	202
Hepatitis A	1		6	7
Hepatitis B			1	1
Hepatitis C			3	3
Hepatitis NOS	1			1
Invasive pneumococcal disease	12	10	29	51
Lead absorption	13	7	17	37
Legionellosis	1		7	8
Leprosy			1	1
Leptospirosis	1	4		5
Listeriosis			1	1
Malaria	1			1
Measles			3	3

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Meningococcal disease	1		9	10
Mumps		1		1
Paratyphoid fever			1	1
Pertussis (probable in brackets)	187 (154)	71 (44)	347 (308)	605 (506)
Rheumatic fever - initial attack	3		8	11
Rubella	1			1
Salmonellosis	32	5	49	86
Shigellosis	1		11	12
Taeniasis			1	1
Tuberculosis disease - new case	10		15	25
Typhoid fever	3		2	5
VTEC/STEC infection	1			1
Yersiniosis	22	4	56	82
TOTAL	569	211	1289	2069

Notifiable cases from 1/1/2012 to 31/12/2012.

Notes:

1. Many notifiable conditions are relatively rare (e.g. in the greater Wellington region we might only see one case per year, a rate of approximately 0.2/100000 population), so that individual general practitioners will not regularly see such cases.

The Medical Council of New Zealand statistics for our region help to put these numbers in perspective:

	Number of GPs	GPs per 100000 pop.
Capital and Coast DHB	282	93
Hutt Valley DHB	97	67
Wairarapa DHB	29	71

Table 4. Regional general practitioner workforce 2011

So for a total of 408 GPs for the region only one GP saw a confirmed paratyphoid case in 2012. This would be equivalent to a paratyphoid rate of 0.3/100 000/year for the Capital and Coast DHB region, so of the 93 GPs covering this population one of these GPs may see a typhoid case once in three years.

General practitioners are most likely to be involved with the more common notifiable diseases, such as pertussis or campylobacteriosis, and are less likely to see cases such as typhoid fever, listeriosis, or mumps. The likelihood of seeing a rare disease is much higher when there is a known outbreak/cluster of cases, so it is important to be aware of any unusual trends in these uncommon diseases (e.g. information received via public health alerts).

2. A confirmed case must meet a specific surveillance case definition, which includes criteria around the clinical description and laboratory diagnosis – otherwise they remain as probable cases or are categorised as "not a case".
3. Cases deemed to be 'not a case' after further investigation are not included in these statistics.

Thank you to all the general practitioners and primary care nurses who have assisted us in our work in 2012.

Guidance on what and how to notify is available at www.rph.org.nz under the Health Professionals tab. You will also find recent public health alerts with updates on current illness issues in the region.

Sources:

1. ESR. Episurv database of notifiable diseases, accessed 25/03/2013.
2. Medical Council of New Zealand. The New Zealand Medical Workforce in 2011.

Ordering Pamphlets and Posters:

To order any Ministry of Health resources, please contact the Health Information Centre on 04 570 9691 or email laurina.francis@huttvalleydhb.org.nz

For enquiries regarding The Public Health Post, please contact Dr Jonathan Kennedy, Medical Officer, Regional Public Health **jonathan.kennedy@huttvalleydhb.org.nz** or by phone **04 570 9002**. Alternatively contact one of the regional Medical Officers of Health: **Dr Jill McKenzie, Dr Margot McLean, Dr Annette Nesdale and Dr Stephen Palmer**

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