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Page 1 “Grandad, What does nosokinetics mean?”

Page 2 Post HSCM2006 thoughts on Nosokinetics, John O’Brien

Page 3. Creating the mission. John O’Brien

Page 4. Nosokinetics – staking our claim Mark Mackay

Page 5. Which flows? What scope? and an analogy. Geoff McDonnell

Page 6 Forthcoming .conferences and HSCMG2006



“Grandad, [What does nosokinetics mean?](#)”

Dear Chlöe

You asked me “What does nosokinetics mean?” That’s a good question. It made me think. As Mummy said “How do you explain to an eight year old what nosokinetics means?”

If you look in a big dictionary you will find words like it, but you won’t find nosokinetics because I made it up. Even my spell checker keeps drawing a red line under it to show me it doesn’t exist. Yet, it does now. For Nana, bringing in my morning coffee, has just said: “It’s written on my conference bag.” Still that doesn’t tell you what it means, so I better get on and answer the question.



“What does nosokinetics mean?” *Noso* is the Greek word for disease and *kinetics* is the Greek word for movement. Diseases make us sick and hospitals treat sick people. Hence, *nosokinetics* describes how health care systems handle patients.

If you look in a big dictionary you will find that *pharmacokinetics* (drug, movement) describes the way that our bodies handle drugs. A hundred years ago, long before I was born, doctors did not know how our bodies absorbed, distributed, digested and excreted drugs. Now, because a new science was created, we do know how and why drugs work.

When I was a young doctor I thought I knew everything that there was to know about how sick people move through hospitals. Then I found out that I was wrong. Now due to the efforts of a small group of people, in different parts of the world, a new science (nosokinetics) is being created which we believe will transform the way that activity in hospitals is measured, modelled and planned.

Now that you are eight years old, you are coming to stay. If you like I will tell you more about it when you come.

Love, Grandad

We were there: Adelaide HSCM2006.

Just to prove we were there, we show Sally, Elia and Gill having a post-conference feedback in Adelaide wild life park. The facilities at Adelaide University were first class and the catering by the Union was second to none, rum babas and chocolate éclairs at breaks – what more could one want. Strict diet was the order of the day when we returned home.



Peer reviewed clinical and theoretical papers will be published in a special issue of the Australian Health Review and in Omega. The deadline for submission is 31st June 2006.

We were overwhelmed by the support and we thank John O’Brien, Geoff O’Donnell, Chris Bain and Mark Mackay for post-conference feedback featured in this issue. Looking back strains the neck and makes one fall over one’s feet as one goes forward. Nevertheless, it would be remiss of us to ignore the tremendous effort that Mark Mackay made to ensure the conference our success.

Our next International conference will be in Ireland in 2008. Hoping to see you all there.

Post HSCM2006 thoughts on scoping the Nosokinetics approach ([link](#))

John O'Brien, Director, Epidemiology Services, Queensland Health, Australia

Editor's comment. *What are we doing? Where are we going? Great conference, so what? Looking in from the outside, scoping our role, John concludes that Nosokinetics is potentially a discrete discipline, with potential to extend beyond hospital gates and into primary and community health care settings.*

HSCM2006 in Adelaide brought together an interesting group of 'bedfellows', who are destined to become known in the future as 'nosokineticists' (*OED compilers – please note first usage – 2006!*). Attendees came principally from the health and ageing sectors, but represented a wide range of clinical and managerial interests - from acute care, chronic/aged care, accident and emergency departments, elective surgery, outpatient management, primary health care, mental health, rehabilitation, and palliative care.

The conference showcased a range of interesting tools for modelling, simulation, scenario planning and scheduling and evidence of their application in clinical management, service and workforce planning, and resource allocation.

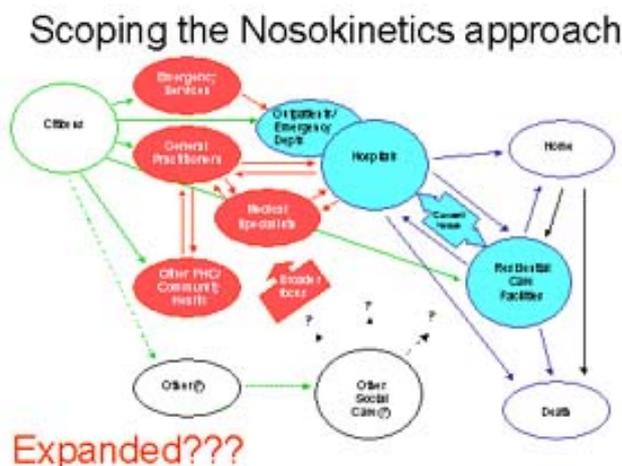
There are probably no surprises that nosokinetics - *the science/subject of measuring and modelling flows in health and social care systems* - had its origins at the junction of geriatrics and aged care, as these are among the areas of greatest competition for 'beds', but the broad definition that has evolved may allow a more inclusive scoping of the science. Occupied Bed Days and Length of Stay are critical to the clinician/manager who is trying to balance demand and supply in a ward, but nosokinetics may permit us to work with a much wider range of metrics.

Contemporary practices in chronic disease management mean more services are being provided in primary health care settings, where similar pressures of need and demand outstripping supply and capacity also apply from time to time. Clinical pathways and management plans, along with examples of sophisticated and systematic use of data linkage, could lead us to a better understanding of the health trajectories of individuals and their likely need for services.

There is already a substantial body of work – represented at the Adelaide conference - on potentially preventable admissions and emerging work on the cost-effectiveness of strategies to achieve reductions in these areas.

Patient/client flows inside health and residential care facilities are definitely within the scope of nosokinetics, but what about encounters with primary and community-based health and health-related services.

Would an expanded scope - including flows through primary health care services and linked to hospital episodes - be valuable in understanding the burden of disease and the dynamics of health system responses?



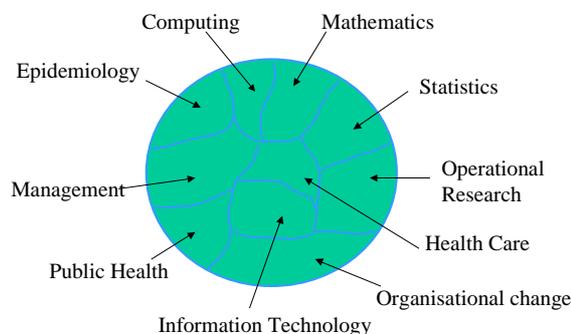
Nosokinetics is potentially a discrete discipline, rather than a 'grand theory' for the health of populations. But, with the judicious use of data linkage and smart cards, could it help us build a comprehensive framework for understanding flows within health and social care systems - beyond the hospital gates? *Ed's note – discussion in these pages is welcomed!*

Creating the Mission: Christopher Bain, Clinical Epidemiology & Health Services Evaluation Unit, Melbourne Health ([link](#))

Mission / Scope

1. To support Nosokinetics Mission
2. Agreement to participate in collaborative activities, around cross fertilisation.
3. Agreement to publicise efforts of Nosokinetics Group – including web links from their organisation.
4. To actively promote (“A Push Model”) the work of the Nosokinetics Group through all relevant communication media – to government, health and social care facilities, researchers and technologists. International collaboration is vital.
5. Commitment to the development of shared understanding and standards where there are gaps between disciplines exist / see 2.
6. Each collaborative activity is driven by an end user and incorporates clearly identified elements of each discipline in the collaboration – all papers / presentations should include the word “Nosokinetics”.

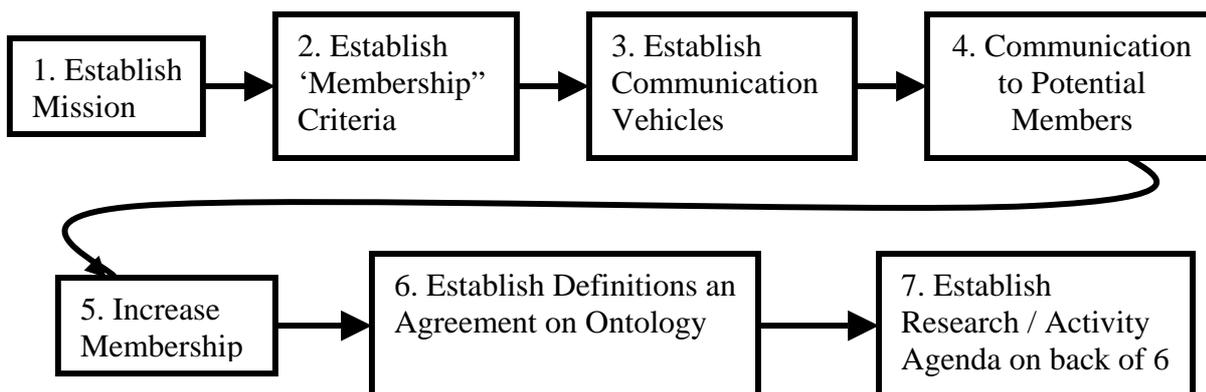
Nosokinetics: a composite field



© Nosokinetics: Chris Brain, Melbourne, Australia

Span of Nosokinetics Discipline			
	Basic Science	Applied Science	Application
Mathematics	xxxxxxxxxx	xxx	
Statistics	xxxxxxxxxx	xxxxx	
Computing	xxxxxxxxxx	xxxxxxx	
Operational Research / MS	xxxx	xxxxxxxxxxx	xxx
Health Care		xxxx	xxxxxxxxxxxx
Public Health		xxxx	xxxxxxxxxxxx
Epidemiology		xxxxxxx	xxxx
Information Technology		xxxx	xxxxxxx
Organisational Science		xxxx	xxxxxxxxxxxx
Economics		xxxx	xxxxxxxxxxxx
Management		xx	xxxxxxxxxxxx

Road Map



Nosokinetics: Which flows? What scope? and an analogy ([link](#))

Geoff McDonnell, Director Adaptive Care Systems, Centre for Health Informatics, University of New South Wales, Australia

I see several difficulties in scaling up your "nosokinetics" origins of geriatric inpatient flow meets mathematics (more specifically Peter meets Sally).

1. Which flows are of interest? Patients, Staff, Other resources, Information, Knowledge?
2. What is the scope of the system of interest?

A recent review of multiscale modelling from cell to organ inside the human body captures the issue rather well.

Bassingthwaite, J. B., H. J. Chizeck and L. E. Atlas (2006). "**Strategies and tactics in multiscale modeling of cell-to-organ systems.**" Proceedings of the IEEE **94**(4): 819- 831.

"Modeling is essential to integrating knowledge of human physiology. Comprehensive self-consistent descriptions expressed in quantitative mathematical form define working hypotheses in testable and reproducible form, and though such models are always "wrong" in the sense of being incomplete or partly incorrect, they provide a means of understanding a system and improving that understanding....

Such models are necessarily simplified to minimize computation and to emphasize the key factors defining system behavior; different model forms are thus often used to represent a system in different ways. Each simplification ... reduces the range of accurate operability at the higher level model... The processes of error recognition, and of mapping between different levels of model complexity and shifting the levels of complexity of models in response to changing conditions, are essential for adaptive modeling and computer simulation of large-scale systems in reasonable time.

Nosokinetics – Staking our claim ([link](#))

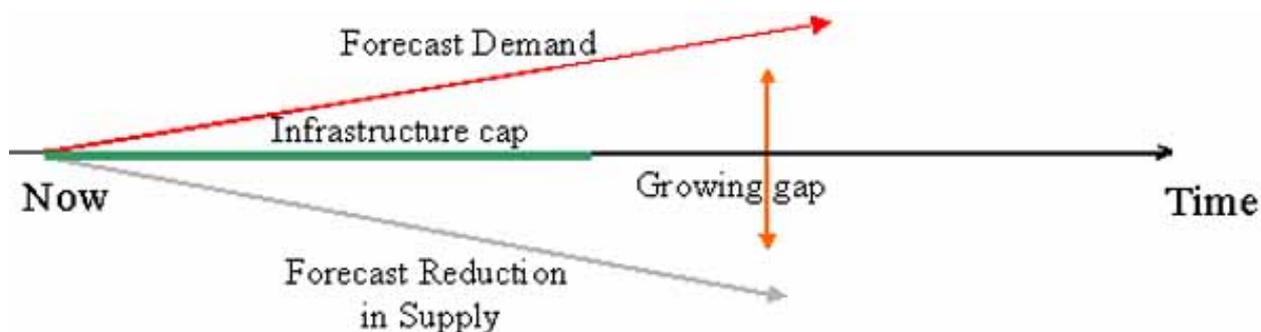
Mark Mackay, University of Adelaide

To get recognition of the value of health care modelling we need more than just modelling skills and the ability to sell the skills. The purpose of this paper is to suggest some of the solution, but also hopefully create some debate about other possibilities (*a copy of the full paper can be found on the website*).

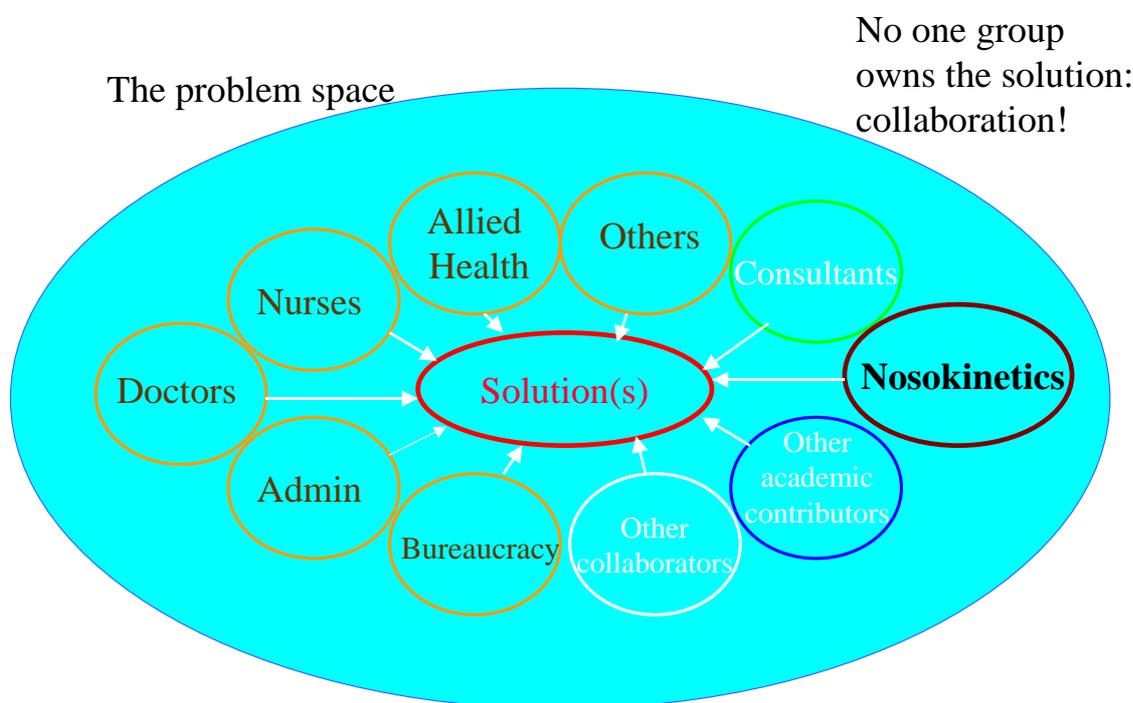
We tend to be interested in the health demand issues, such as queue times, capacity planning, flow rates, etc. It probably stems from the drivers of our interests – bed blockages, political and media interests, funding interests etc. There's also been much work in recent years to suggest that demand for services will increase.

BUT there's a supply side to this industry as well and it's one that's often overlooked. To fix the problem, whatever it may be, often involves adding more resources. In health more resources usually means more staff somewhere.

The changing population profiles have a double whammy effect - at the very time when there are more older people demanding services, the number of workers will decline (the baby boomers are retiring). This leads to a gap between supply and demand. The gap between supply and demand represents a problem and an opportunity. This is where those working on nosokinetics can help.



We all know that there is much to be done in the health system. But who can provide the solutions? The following diagram attempts to show the players who can be a part of the health game.



■ Health care industry

It should be acknowledged that those in the Nosokinetics group are likely to have interests in mathematics and statistics. Thus, there is both potential to grow those interested in Nosokinetics and also the role of nosokinetics in solving health care system problems!

There are a range of factors that will help engagement between nosokinetics and problem owners occur (see the full article), and it should be noted that no single solution will work.

Is the glass half-empty or half-full? If it's half-empty, let's give up now and go home or join another game. If the glass is half-full, then there's plenty of opportunity to contribute to the health care sector. It's not necessarily going to be easy going though – particularly as we all know it's not easy to get funding for health services or systems research type work - and it may take time.

Editor Further discussion on these issues will be welcome
<mailto:nosokinetics@tiscali.co.uk>

Forthcoming conferences

EURO XXI 21st European Conference on Operational Research, Reykjavik, Iceland July 2-5, 2006 OR in Health Care Sally Brailsford (S.C.Brailsford@soton.ac.uk)
Jan Vissers (vissers@bmg.eur.nl)

OR 48 The Annual Conference of Operational Research Society, Bath, UK, 11-13 September 2006. Bath - a beautiful town with lots of interesting history and culture See <http://www.orsoc.org.uk/> for more details.

RSS 2006 International conference of the Royal Statistical Society. Queen's University Belfast, 10-14th September 2006. contact p.gentry@rss.org.ukn

SimTecT 2006

Healthcare Simulation Conference 11-14 September 2006

Royal Brisbane & Women's Hospital Education Centre / Queensland Health Skills Development Centre.

Theme: "Simulation is for Patient Safety"

N.B. A "when people meet systems" program thread has been added for this year. Abstracts close June 23. See <http://www.simtecthealth.co/>

International Health and Social Care Modelling Conference comes to Adelaide



Left: Jim opening the conference

Below: Prof Peter Millard - international convenor - giving a presentation



The first International Conference on Health and Social Care Modelling and Applications was opened by Jim Birch in Adelaide on 19 April 2006.

Delegates from interstate and overseas attended the two and a half day conference at the University

of Adelaide where nearly 50 papers were presented on topics such as patient flow, data linkage, control processes, communication processes and workforce issues.

"This conference provided an opportunity for modellers, clinicians and others to exchange their ideas and experiences in what has traditionally been considered a niche field of health care," Mark Mackay, conference organiser said.

"The conference has already elevated interest in health care modelling within Australia and work is now underway to create international and national groups to drive this work forward."

The next conference has been set down for 2008 and will be held in Ireland.

For more information on the conference papers contact Mark Mackay, Principal Project Officer in the Office of Health Reform at mark.mackay@health.sa.gov.au or phone 8463 6130.

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Nosokinetics News is mailed to supporters and collaborators interested in developing a scientifically valid approach to measuring and modeling health and social care systems. To be added to / removed from the mailing list email nosokinetics. Editor: Prof Peter H Millard. For earlier editions <http://www2.wmin.ac.uk/coiec/nosokinetics.htm> The on line version is at <http://www.iol.ie/~rjtechne/millard/index0.htm>.