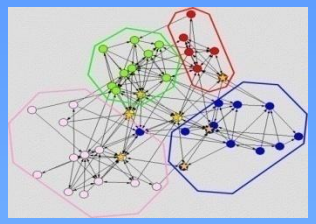

Towards safer, better health care: leveraging the strength of networks

AHA Think Tank Session:

"Translating evidence into practice: an action plan"

10 August 2007, Sydney

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Background - the Centre

The Centre for Clinical Governance Research undertakes strategic research, evaluations and research-based projects of national and international standing with a core interest to investigate health sector issues of policy, culture, systems, governance and leadership.

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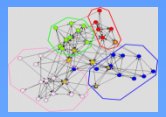

Research team

- Professor Jeffrey Braithwaite
- Professor Bill Runciman
- Professor Alan Merry

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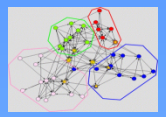

PART A: a problem and proposal

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Problem: we have thrown a lot at patient safety

- Training
- Reorganisation
- Policy
- Data
- Guidelines
- Accreditation

- Root cause analysis
- New posts
- Information management
- [Insert your own favourite strategy here]

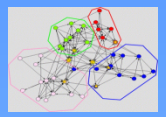
But with mixed success

- Overall, such measures have proven inadequate
- We propose we need to harness:

the natural properties of the complex sociotechnical health system [Braithwaite, Runciman and Merry, 2007]

Why?

- Conventional top down interventions result in only modest improvements
- Patient safety is a wicked problem – one that is messy, persistent and multi-dimentional
- Politicians, bureaucrats seek to shape clinical practice by edict
- But clinical practice is actually shaped by the behaviours, attitudes of thousands of practicing clinicians



PART B: natural properties of complex systems

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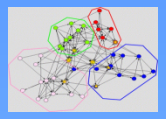

Many complex systems have similar natural properties and behaviours

- Common network features have been identified by researchers in fields as diverse as mathematics, sociology, marketing science, psychology
- We need to harness these features to create spread and sustainable change

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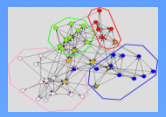


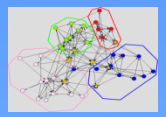
Natural properties of complex systems

Properties of complex systems	Health care manifestations
Natural networks	Groups of clinicians who interact professionally to share information, support, consult, refer, and jointly manage patients
Natural hubs and scale-free behaviour	Opinion leaders in networks who disproportionately influence policies, events or practices
Natural pathways, connectivity and small-worlds	Communication channels facilitating the rapid dissemination of information via “grapevines” and communities of practice.
Natural appeal and stickiness	Messages and communications that are convincing, and are absorbed amongst clinical cohorts
Natural propagation and tipping points	The point at which a message, idea or practice whose time has come is readily adopted by a critical mass of clinicians
Natural categories and natural mapping	The identification of clinically relevant problems grouped as accessible data, to facilitate decision-making and solutions to health care problems
Natural interest and self-selection	Clinicians with common concerns and complementary expertise voluntarily grouped together to collectively resolve coal-face clinical problems

PART C: articulating these natural properties

Two types of networks

- Type A: purpose-designed, funded or imposed by authority, in structured organisational or institutional forms [designed, mandated networks]
- Type B: those composed of the relationships amongst clinicians, via professional interests, referrals, supports, friendships, communications and advice [natural networks]



Natural networks

- Natural networks do not respond well to conventional management or control measures
- They emerge spontaneously and propagate or function with little or no externally imposed structure or resources
- They can exert powerful and pervasive influences on how systems function

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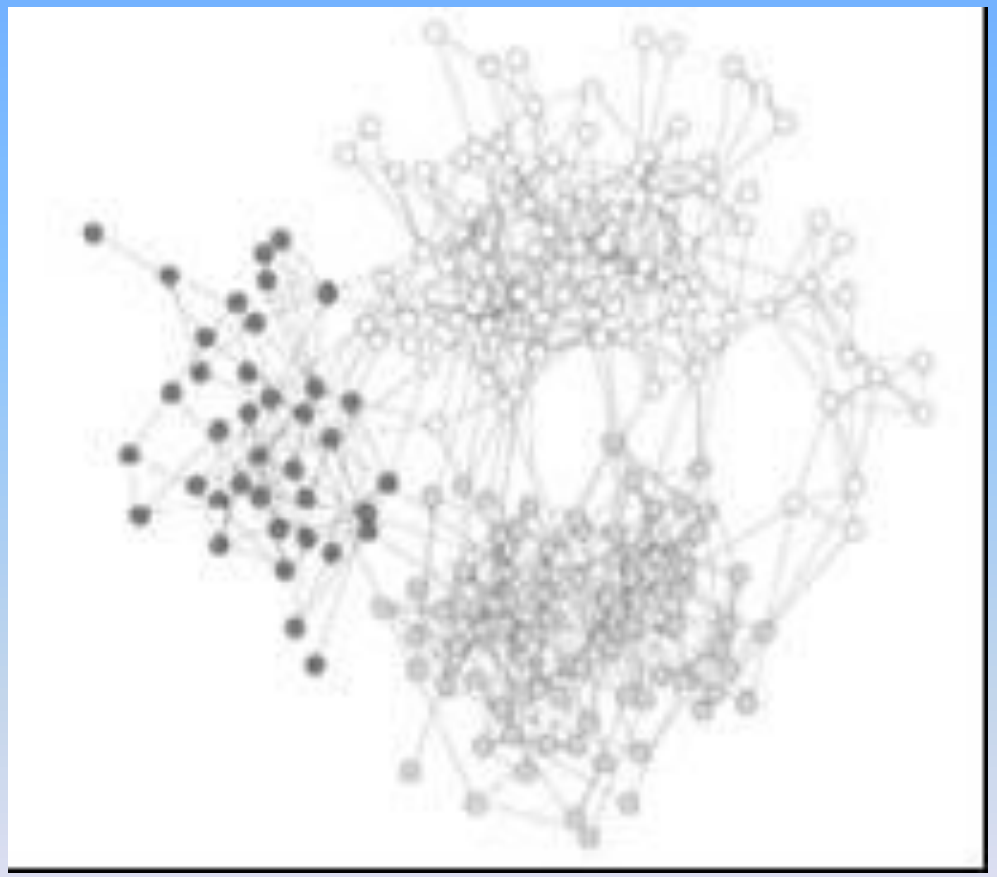
Example A: friendship clusters in a school



[Moody, 2001]

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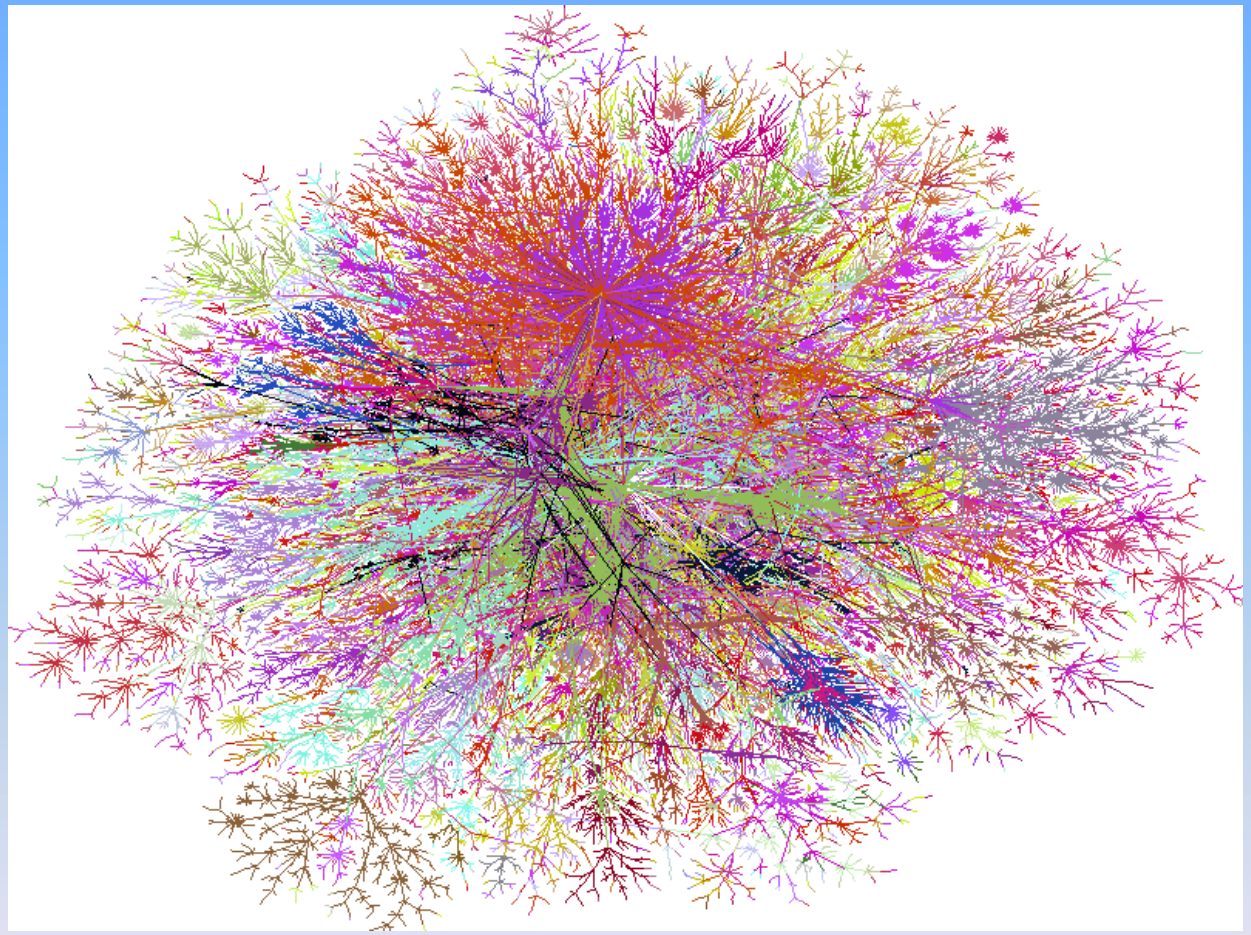
Example B: the internet



[Cheswick, 2007]

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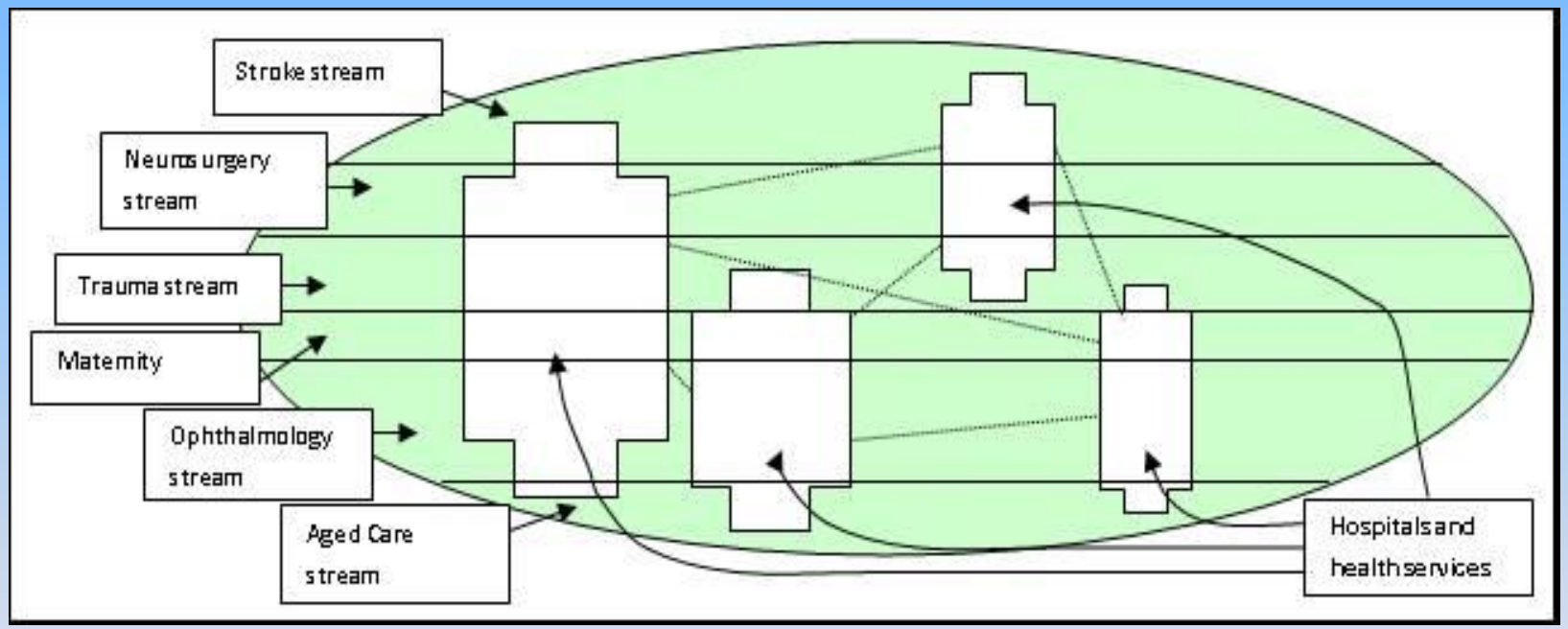
Example C: clinicians networked in GMT²



[Braithwaite and Goulston, 2004]

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Example D: obesity ties in the Framingham Health Study

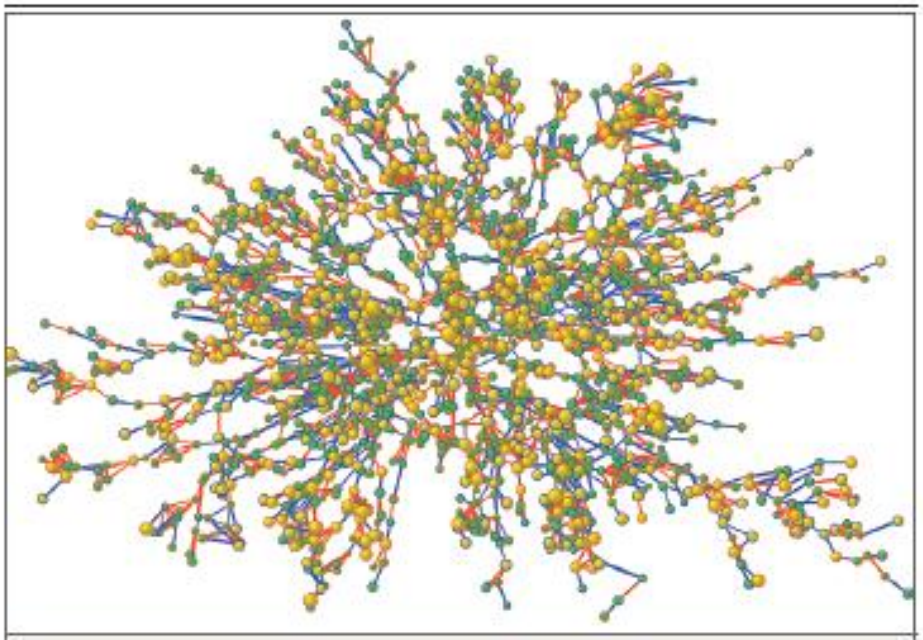

Figure 1. Largest Connected Subcomponent of the Social Network in the Framingham Heart Study in the Year 2000.
Each circle (node) represents one person in the data set. There are 2200 persons in this subcomponent of the social network. Circles with red borders denote women, and circles with blue borders denote men. The size of each circle is proportional to the person's body-mass index. The interior color of the circles indicates the person's obesity status: yellow denotes an obese person (body-mass index, ≥30) and green denotes a nonobese person. The colors of the ties between the nodes indicate the relationship between them: purple denotes a friendship or marital tie and orange denotes a familial tie.

N ENG L J MED 357;4 WWW.NEJM.ORG JULY 26, 2007

[Christakis and Fowler, 2007]

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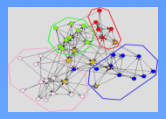

Natural hubs and scale-free behaviour

- Nodes [hubs] are not randomly distributed [scalable] but are scale-free
- I.e., they are unequally distributed
- Many nodes are relatively isolated, with one or two links
- Some nodes have a moderate number of links

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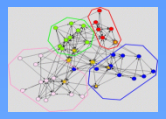

Natural hubs and scale-free behaviour

- Others are the distributed force field of the network, with many links
- These are the:
  - Google search engine
  - King's Cross St Pancras railway station
  - Prominent clinicians at the centre of nests of referral, consultation or collegial patterns

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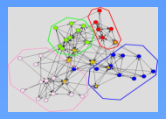

Natural hubs and scale-free behaviour

- Counter-intuitively, scale-free networks resist jamming
- They concentrate effort efficiently
- The hubs are the key to this efficiency

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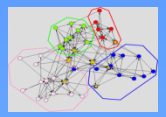

Natural pathways, connectivity and small worlds

- The sociology of networks is that they can be highly efficient
- The term for this is ‘small worlds’
- These are fast, navigable routes through the complex montage of connections

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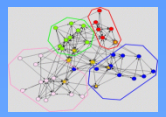


Natural pathways, connectivity and small worlds

- The ties between any two of us can be mapped through no more than ‘six degrees of separation’
- You do not have to know everyone in a chain across the six degrees – just the next person, who knows someone else, and so on

Natural appeal and stickiness

- Messages in a network have to be remembered, and acted upon
- Stickiness is about how memorable a message is – how it is presented, cognitively processed and encoded
- Sticky messages have natural appeal
- Stickiness is enhanced by novel messages, smooth transition modes, and cues in the environment

Natural appeal and stickiness

- As well as:
  - Using forcing functions to facilitate compliance
  - Using a critical mass of champions or opinion leaders to make the message stick

Natural propagation and tipping points

- A tipping point is the stage when a critical mass for sustained momentum is reached
- It's the juncture when a concept, social movement, or epidemic catches
- It often requires a trigger for a state change, known as 'a phase transition'
- EBM, for example, has not reached this point – yet

Natural categories and natural mapping

- To deal with patient safety, we need to find out what is going wrong, then how and why things are going wrong
- In order to disseminate preventative, and corrective strategies
- These need to be meaningful to clinicians
- Thus we need to categorise data into *clinically meaningful categories*

Natural categories and natural mapping

- Runciman's principal natural categories [PNCs] are a case in point
- Natural mapping allows for things to be grouped in a representation reflecting their relationships in the real world
- It allows data to be stored, then abstracted and analysed for future use

PART D: towards a bottom-up solution to patient safety

Putting natural interest and self-selection to work

- For every healthcare problem there are hubs, clusters and sub-clusters made up of clinicians with a special interest and expertise in that area
- Inviting interested parties to engage, review a problem area, and make a plan to address it is a successful strategy – when it works

Putting natural interest and self-selection to work

- Additional network members with interest or motivation can be recruited
- Some will already be integrated in the network with weak or strong ties
- Others will be more distantly related
- This gets together people with natural interest, coalescing around a problem, who are self-selected

Exploring this idea

- Top-down initiatives will happen anyway – they are the obsession of those in authority, and will continue
- *We propose asking expert groups with natural interest in a problem corresponding to a natural category which compromises the safety and quality of healthcare by harnessing the natural properties of networks and clinicians' behaviour*

Exploring this idea

- Examples: Runciman's pulse oximeters in the 1980s, NICE in the UK, Joanna Briggs in Australia more recently
- Initial problems could be those that are widespread, costly and amenable to mitigation by proven interventions of reasonable cost-benefit

Our steps

1. Choose a problem
2. Provide modest funding for 2–3 experts to present at a meeting
3. Publicly involve others, especially hubs and those in networks
4. Exclude no-one
5. Purpose of meetings: develop a tool to address the problem
6. Or develop a plan to develop a tool

Why tools not guidelines?

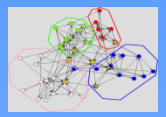
- Guidelines tolerate outdated habits and idiosyncratic practices
- Tools should have a quadruple purpose:
  - Outline what should be done
  - Record that tasks have to be done
  - Faciliate audit
  - Promote dissemination, stickiness and use of the principle

Why tools not guidelines?

- Solutions developed and tools should incorporate standards, and be endorsed by professional organisations
- And be kept up to date by the network

Natural surveillance and collegial behaviour

- Compliance with the tools should be audited informally within the network
- Tools should be designed to make compliance easy
- No-compliance should be justified
- Using natural surveillance by the network will be an important feature
- Tools incorporating standards can be subject to more formal audit



PART E: concluding remarks

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Conclusion

- The evidence is strong – current approaches to addressing health system problems are inadequate
- Hierarchical approaches have largely failed in the face of entrenched opposing forces of clinical autonomy
- We should harness the natural properties of the sociotechnical system which come naturally to clinicians

Conclusion

- This promotes effective self-regulation
- Clinicians work best when they are encouraged to flourish in groupings of their own interests and preference
- When they are empowered not directed
- And nurtured and influenced by their peers rather than controlled by others

Conclusion

- They need to be invited not compelled
- And encouraged to solve naturally-occurring problems in voluntary collaborations with fellow clinicians
- We propose encouraging the use of natural properties in complex sociotechnical systems
- And the development and use of mutually constructed tools

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