CLINICAL SERVICE LINE MANAGEMENT IN HEALTHCARE SYSTEMS

What is it?

A management model which organises and markets healthcare services based on care *outputs* (patient centred services), as opposed to its inputs (traditional structure centred on providers of the same discipline eg, departments of medicine, nursing, radiotherapists).

Three types of care outputs can be used to form a clinical service line:

1. Disease management eg, comprehensive care for cancer, or for heart disease.
2. Care of identifiable segments of the population, such as the elderly or children.
3. A procedure or intervention eg, organ transplantation, or joint replacement.

The most common clinical service lines are heart institutes, cancer centres, orthopaedic hospitals, spine centres, women's and children's services, and gastroenterology endoscopy suites.

The service line model groups together people of different professions and disciplines, who share a common purpose of producing a comprehensive set of clinical services to achieve a particular clinical output. For example, a cardiac service line may consist of cardiologists, cardiothoracic-surgeons, nurses, exercise physiologists, and dieticians, who collectively and in a coordinated fashion, provide a full spectrum of services ranging from screening and wellness interventions aimed at people at risk of heart disease, to cardiac rehabilitation for patients recovering from cardiac surgery.

Key defining characteristics of clinical service lines are:

- They have a clinical care mission – with an identifiable market/diagnostic category;
- They are multidisciplinary;
- They provide a mechanism for integrating personnel and services across disciplines;
- They are administratively manageable, measurable and therefore accountable units.

Where has this been implemented?

Largely in the USA, where clinical service lines have been used in individual hospitals since the early 1980s eg, University Hospital of Cleveland, Johns Hopkins. Since the 1990s, it has also been implemented in 'Integrated Healthcare Delivery Systems' (IDSs), which consist of multiple facilities and types of care under a common ownership arrangement. IDSs were driven by the growth of managed care and payer preferences for 'one stop shopping'. An example is the Veteran's Health Administration (VHA) which, in 1995, underwent nationwide reorganisation into 22 regional IDSs, termed "Veterans Integrated Service Networks". Following this, many VHA facilities and IDSs reorganised into service lines.

Service line management has also been implemented at several NHS foundation trusts in the UK.

Reasons for implementation:

- To improve coordination of patient care - with the expected result of better outcomes. The rationale is that focusing on a narrow range of conditions permits nurses and physicians to more easily apply their expertise and experience, to achieve operational excellence
- As a way of organising jobs and care, and fostering collaboration across multiple healthcare facilities (IDSs)
- To improve marketability of a hospital – the development of specialty service lines allows hospitals to market new services and compete directly with physician-owned specialty facilities in the increasingly competitive U.S health care environment. Service lines that are marketed as "centres of excellence" or that are seen as essential to the community (eg, child health) also help to raise a hospital's image and reputation.
- To attract specialist physicians to admit patients to that hospital – US hospitals compete for patient referrals/admissions, and the specialised service line model can best respond to physicians' demands around scheduling, having the latest equipment, and working with a dedicated nursing staff. This keeps specialists from moving their work outside the hospital.
- To meet consumers' expectations and choice for 'one stop shopping' for a particular type of healthcare service – service lines offer coordinated prevention, diagnosis and treatment under one roof.
- To increase revenue and profitability – the service line model allows hospitals to create profit centres by focusing investment on their best performing, most profitable services lines, where they have the possibility of gaining or enhancing market share, while correspondingly reducing or eliminating money-losing services (such as mental health). For a hospital in dire financial straits, this strategy may re-establish its financial viability.

Background

Clinical service lines are based on the product-line management model, developed in the U.S manufacturing industry. Manufacturing firms grew in size by diversifying into multiple lines of business. To manage this diversity, distinct divisions for each product

were created, consisting of all the professions and disciplines needed to develop, manufacture and sell that product/set of related products. Each product-line division operated effectively as a mini-business, and this management technique was lauded for improving cost control, and increased accountability and profitability.

The adoption of the product-line management model into healthcare, can be traced as a response to changes in the system of health funding in the US over the past few decades. In the early 1980s, when federal reimbursement programmes started using Diagnosis Related Groups (DRGs) and Major Diagnostic Categories (MDCs), product-line management emerged as a possible management tool for healthcare organisations. In the mid 1990s, the service line model fell out of trend, as hospitals were primarily competing on price for providing services desired by managed care plans. However, by 2000, with the return to fee-for–service payment, hospitals returned to the traditional business model of competing with each other to fill beds with well-insured patients. Business strategies targeted at increasing patient flow were revived; with hospitals competing for physicians' loyalty by building the best facilities with the latest technologies, as well as marketing toward consumers directly. This form of competition amongst healthcare facilities tended to increase, rather than decrease, costs compared to the less competitive previous managed care era. Moreover, hospitals faced a rapidly expanding threat from physician-owned ambulatory diagnostic and treatment facilities over a number of specialty service lines. In response to this competition, hospitals adopted their own specialty service lines.

Service line branding

A 2005 study[1] of 33 US hospital systems in 12 random communities, found that in every market, hospitals and physicians were developing single specialty service lines, the most common being heart, cancer, orthopaedics, and several spine centres. Hospital executives openly referred to their service line competitive strategies, with one study respondent stating, "I became the CEO, started the service lines, got the ship profitable". The study observed how hospitals that had previously marketed their entire organisation generically to the public, were increasingly marketing branded specialty service lines. These service lines are typically branded as "institutes", "hospitals", or "centres" – for example, the Heart Hospital of Indiana, the Seattle Cancer Treatment and Wellness Center, the Baptist Cardiac and Vascular Institute in Miami. Commonly, hospitals and physicians market their service line as a "centre of excellence" although there is usually no validated quality data to back up the claim. The direct-to-consumer service line strategy in the US has included advertising via billboards, radio, print media and television.

Service line branding may also enhance a hospital's image and reputation. Although certain service lines such as women's and child services may be less profitable, these would be seen as a "must have" service line because of the reputational value to the hospital in the community.

How service lines are organised

For the most part, service lines are specialty centres housed within a general hospital – on separate floors/wings, or in separate administrative units (inpatient or outpatient) within a hospital. However, they may also exist as freestanding specialty hospitals. In the outpatient setting, examples of specialty service lines include venues dedicated to GI endoscopy, diagnostic imaging, sleep disorders, peripheral vascular disease ("varicose vein centres"), cosmetic surgery, radiation therapy, and cancer chemotherapy. As the range of surgical procedures that can safely be performed in an outpatient setting expands, more and more physician-owned ambulatory facilities are offering speciality services that were previously only offered in hospitals eg, CT angiography being offered by cardiologists in their offices. This phenomenon has led to some US hospitals shutting down their GI endoscopy suites, except for use in emergencies, because of insufficient patient volume, as most endoscopy is now performed in the outpatient setting.

The administrative and clinical structure of service lines varies greatly. At one end of the continuum, service lines serve purely as a branding and marketing strategy rather than reorganising care; they do not have independent staff or administration, are not considered a separate cost or profit centre, and do not have their own business plan. Examples are coronary care units or an orthopaedics floor, integrated into the structure of a general hospital, but marketed to the public as a unique service.

At the other extreme, service line resources are physically co-located, the service line has its own dedicated staff and distinct managerial structure, and functions independently as a "hospital within a hospital". It may even have a distinct ownership. An example of a hospital within a hospital is the Cathedral Heart and Vascular Institute located in St Michael's Hospital in New Jersey. The institute has a dedicated physician and nursing staff and is a financial profit centre for the remainder of the hospital. Another example is the Indiana Heart Hospital, which is located on a hospital campus but is operated as a joint venture between the hospital system and a group of cardiologists. Hospitals sometimes enter into joint ventures to maintain some percentage of the specialised service revenue instead of losing it all to a physician-owned facility.

In the intermediary position, a service line such as a stroke centre might have its own floor and a manager, but the hospital may or may not assign a dedicated nursing staff to the service line, which is an integral part of the hospital and otherwise dependent on general hospital resources. This is the most commonly employed form of service line – in which the aggregated patient population co-exists with a functional (departmental) resource structure. Termed 'matrix design', its advantage is that it spreads responsibility for the organisational, clinical, and financial success of a service line among both the clinicians and administrators of the service line; therefore giving them shared incentive to work together in designing and implementing a service that will improve clinical outcomes via better coordination of care.

The 'Charns-Tewksbury continuum' is a widely used 9-point continuum describing service line structure at an individual facility level. At point 1, there is no service line and only traditional functional departments organised by clinical inputs. Moving up the continuum, a service line manager is introduced whose authority over personnel becomes formalised and accountability for resources increases, so that at point 9, the

manager has complete formal authority and accountability for personnel evaluations, placements and operations.[2]

Leadership

The service line model involves a shift from the traditional vertical hierarchical style of management, to a horizontal team based management style - where leaders accept that those who perform the actual tasks are the ones that drive the organisation, and therefore build a support system around the point of service. For service lines to be truly effective, their leaders need the authority to make strategic decisions that can result in real changes in costs and quality. Typically, the leader is considered to be the CEO of that particular clinical service dimension. The leader's role is to empower those employees who provide the actual services and care to be involved in the management decision-making for the service line. This also calls for a change in employee mentality of "this is just a job" to one of ownership and engagement in the planning and delivery of service lines to achieve best outcomes.[3]

The **critical role of the Physician–Leader** is described as:[4]
1. Needs assessment – defining patient/market demand and assisting administrators in setting priority service lines.
2. Planning – developing plans and budgets for facilities, services, technology, marketing, insurers.
3. Service line management – providing clinical and administrative leadership and accountability for the service line to hospital administration.
4. Monitoring and evaluation of service line – collecting and analysing information on cost, profitability, quality and customer service, and using this information to improve the service line.

For service lines to be truly effective, their leaders need the authority to make strategic decisions that can result in real changes in costs and quality. In a mature model, the leader is typically considered to be the CEO of that particular clinical service dimension.

Evidence of benefit in the literature

Despite the fact that service lines have been used in healthcare for over 20 years, and are increasingly being adopted throughout the US, much of the literature is conceptual, and there is little empirical evidence of the effectiveness of the model on quality of care and meeting healthcare goals.

Studies have found hospital administrators *perceive* service line management as providing the following beneficial effects:

- Increased accountability (Ruffner 1986); the model allows financial and clinical outcome data to be more accurately collected, ensuring accountability by managers.
- Improved lines of communication and reduced barriers/friction between clinicians and nonphysician executives (Fackelmann, 1985)

- Successful interdisciplinary collaboration arising from trust, shared goals, and ownership (Liedtka and Whitten 1998)
- Improved market orientation (Ruffner, 1986); a way of marketing existing services in a form more easily understood by patients; strengthening the brand of a healthcare organisation.
- An entrepreneurial culture (Ruffner, 1986; Manning, 1987)
- Offers flexibility in responding to changes in health care markets and local demographics.

Despite these perceived benefits, the few studies that have been done do not show consistent objective evidence of beneficial effect. These suggest that **service lines may produce positive financial and cost-efficiency outcomes** if carefully implemented, **but evidence of benefit to quality outcomes is lacking:**

1. Liedtka and Whitten[5] found that while stakeholder perception was that service line management was successful after one year of implementation, there was ***no improvement in objective performance data on cost per Diagnosis Related Groups (DRG), length of stay, or patient satisfaction.*** The authors suggest that ***a change in organisational structure is not enough to improve care - the real benefits result from the redesign of the care processes themselves, and that is unlikely to occur unless/until the groups of individual practitioners learn to collaborate*** with at least moderate competence.

2. Byrne et al,[6] studied 140 VHA facilities, of which 71 had implemented clinical service lines in primary care, and 67 had implemented a mental health service line. The study found that overall, the presence of a mental health service line resulted in no significant effect in mental health outcomes measures of psychiatric bed day rate, acute care bed day rate, or 30-day readmission rate. Facilities with primary care service lines showed significantly less improvement than those without service lines, in 3 outcome measures: preventable hospitalisations, urgent care visit rates, and urgent care visits per total visits. It was noted that, in the private sector, service lines are typically implemented in specialties, rather than in primary care clinics. The findings suggest that the delivery of ***primary care may not be suited to service line management***. Although the study did not evaluate the effect of service lines on other aspects of quality such as improved patient health or satisfaction, the conclusion was that ***health care systems should be cautious in implementing service lines when the goal is to improve performance on health care utilisation measures.***

3. A 1993 nationwide sample of 157 hospitals in the USA found several operational benefits of the clinical service line model for hospital management.[7] One third of the hospitals sampled were implementing clinical service lines at the time. The hospitals adopting service line management showed a ***higher net income per bed, a higher gross revenue per bed, a higher return on equity, and a lower salary to revenue ratio.*** It was not possible to establish a cause and effect relationship between service line management and performance (because the study did not examine the hospitals' performance indicators prior to introduction of service lines), however, there appeared to be a positive association between the two.

The hospital profile fitting greatest likelihood of success with service line management was found to be: an urban hospital of at least medium size, located in a highly competitive market area, serving a population of at least 200,000, with a strong marketing orientation (89% of hospitals had a proactive marketing department), and featuring areas of "excellence" in their product mix.

Correspondingly, the study supported the contention that service line management is not for all hospitals, and is the least desirable approach for small-sized hospitals serving a largely rural market. These small hospitals lack resources for service line management implementation and would probably find linkages with larger regional hospitals a sounder strategy.

4. A King's fund study of service lines in 7 NHS trusts in 2011[8], found considerable variation in success of implementation and little evidence yet that data was being used systematically to produce tangible improvements to services.

5. Implementation of service lines in heart and vascular care, cancer care, and paediatrics at the University of Wisconsin Hospital and Clinics, an academic healthcare organisation, produced ***increases in net revenue, profitability and market share, as well as increases in patient satisfaction, patient throughput and reduced average length of inpatient stay.***[9] Quality improvement was not an objective of service line implementation in this case – rather it was to increase financial profitability. (See attached case study for further detail about this).

6. Performance analysis of a trauma centre service line[10] within a large US medical centre over the initial 3 years following implementation, showed ***no change in mortality, moderate improvement in average length of stay*** (15% reduction was noted for moderate and severe injury classes only), and a ***large improvement in net operating margins*** as compared to its preceding performance. The "profitability" of trauma care went from negative before the Trauma Unit to strongly positive in the three-year period after its opening, not from reductions in cost, but from sharply increased hospital reimbursements. These results were achieved with stable acuity levels (i.e., unchanged severity scores) while treating 55% more patients than before. Financial success was partly attributed to the ability to market the hospital as the best provider of trauma care in the region. The authors credit the success of the trauma service line to the following salient features: (1) A clearly identified patient population, i.e., adult trauma cases, (2) a philosophy of "process complete," i.e., the notion that patients should be admitted, treated and discharged under the auspices of one hospital unit in one location, (3) dedicated and consolidated space in the form of four contiguous sub-areas with fluid boundaries; this structure avoids unnecessary patient transport, provides flexible bed capacity, and allows intensive physician–nursing staff communication; the Receiving area appears unique to trauma care, (4) testing and pharmacy facilities within Unit space, (5) a leadership, assisted by a financial manager, that has adopted a business perspective on how the "trauma business" is to be operated, (6) dedicated, cross-trained, and deeply skilled team-based nurses and care partners serving all four of the unit's sub-areas–thereby providing labour flexibility, (7) trained nurse practitioners serving

as "physician extenders" and caring for satellite patients transferred out from the Trauma Unit so beds can be freed up, (8) a dedicated non-nursing service staff, (9) the use of a large number of care protocols, which have reduced variations in care and improved physician–nurse communication and relations, (10) a continual focus on improvement of the care process, (11) a strong, team-oriented "can-do" culture, and (12) economic information sharing and incentives - a group bonus component was included in the salary structure for trauma physicians. Group performance was reviewed with the physicians each month. According to one trauma surgeon, reviewing the numbers "is absolutely motivational," while another commented that "if you don't understand the business side of medicine you cannot move your program forward."

The US experience of how to implement service lines:

1. Identify the facility's core services – those that are necessary for survival of the hospital, that are valuable to the marketplace, and that represent potential growth for the facility. This involves detailed knowledge of the demographics of the area, forecasting the needs of changing demographics, and assessing use rates and market share for particular service lines. This will help determine the potential success of a service line. An example of marketplace value would be the creation of 'centres of excellence' – involving a facility to focus primarily on very few lines and to channel resources into these lines.
2. From the above, define 2 or 3 lines to develop.
3. Develop appropriate business plans.
4. Compete aggressively and competitively.
5. After implementation, monitor the service line's effectiveness through metrics such as:

— Clinical quality indicators such as risk adjusted mortality and morbidity rates for high-volume cases within the service line
— Clinical outcomes measured against organisational/national clinical targets
— Customer satisfaction indices
— Financial indices (profit margins before and after implementation)
— Ongoing market share analysis

6. Apply the model throughout the organisation.

Barriers to implementation:

- Lack of physician 'buy in' to the concept of service lines – the service line model runs counter to the traditional organisational structure and functional autonomy of departments which may be highly valued by members of a profession. The literature suggests it may take 3 to 5 years for any organisational change to become anchored in the culture of an organisation.
- Ambiguity over role delineation and accountability within the service line.
- Administrator-clinician difficulty identifying priority service lines
- If service lines are primarily adopted for a marketing tool, there may be a backlash from clinicians – who may perceive the model as a means of increasing

patient volumes without any accompanying resource changes or quality improvement initiatives.
- Cost and time in putting in place data reporting systems and training staff to use them effectively.
- Cost and time to develop leadership and management programmes for clinicians, which may reduce their clinical output.

Lessons learned:

- Administrative restructuring into service lines units by itself will not cause performance improvement. The success of service lines also depends on patient volume and regional needs, process improvement and implementation management. .
- It is important that physicians be involved at the beginning of the planning process; involving them late will lead to high levels of dissatisfaction and distrust - multiple studies cite physician support or 'buy-in' as the critical key to success in service lines[11].
- Involved parties must have full knowledge of, and provide their approval of, any organisational changes affecting accountability structure and autonomy, to ensure maximal cooperation and minimal ambiguity when working within the new service line structure.
- Well resourced financial and informatics departments are crucial. Service line management seems to work best when finance and informatics teams work closely with service line leaders to understand their information needs and produce data that is meaningful to clinicians.
- Successful service lines in the US feature financial incentives at a departmental level. However, the cause-effect nature of incentivisation, particularly in the public health system, has not been clearly established.
- Benefits of service line management have been seen in financial profitability and operational efficiency (reduced length of stay, increased case volume), but there is no clear evidence of improved quality of care/clinical outcomes.
- Physical co-location of service line resources is a consistent feature of successful service lines.
- Role of marketing – the degree to which marketing and branding contributes to financial success of service lines is unclear, but likely to be significant. (89% of US hospitals with service lines had proactive marketing programs with higher marketing budgets compared to hospitals without service lines[12])
- The literature suggests that it may take up to 2 years before the effects of service line restructuring can be noticed (Liedtka and Whitten (1998); Walston and Bogue (1999)). However, careful planning and implementation can reduce this period of disruption.
- Not all specialties may be suited to the service line model eg, primary care
- The extent to which hospitals can successfully develop service lines is dependent on the size and strength of the institution and regional needs. "*All institutions have a limited set of resources and at some point you cannot do it all.*"

Why adopt a Service Line model at WDHB?

- The concept is in keeping with Ministry of Health and DHB targets, which are output based ie, described in terms of cardiac services, mental health, child health, cancer, elective surgery, health of older people, emergency care, stroke, Maori health , Pacific health. A service line approach should theoretically facilitate care that is more efficiently focussed toward these targets and make it easier to measure performance against these targets.
- It is a patient-centred, 'one stop shop', streamlined and coordinated care model
- It can produce improvements in operational cost-efficiency and increased patient/case volumes
- WDHB already has some experience of implementation with the ESC service line

Cautions / Questions to consider:

Most experience with the service line models is in the USA – for profit-driven reasons related to private healthcare market competition. One criticism of the service line model is its focus purely on productivity - healthcare equity and accessibility are not key issues[13]. The model creates net profit by redistributing limited healthcare resources – channelling investment and resources into a hospital's profitable services, and correspondingly reducing or eliminating resources to its non-profitable services, such as mental health care. This scenario is not translatable to the NZ public hospital system.

When considering whether to implement service line model, it is important to identify:

1. What is the objective of restructuring? (noting that if the goal is improved quality of care, or reducing inequalities, then there is no evidence that service line management will have significant effect)

2. How receptive are various specialties at WDHB/ADHB to the idea of working collaboratively within a service line? Are there professional 'cultural' differences that may impede service line collaboration between particular groups? Need to ask them eg, gastroenterologists & colorectal surgeons; cardiologists and cardiothoracic surgeons

3. A criticism in the literature is that service line management may not necessarily eliminate functional management (Goodrich and Hastings 1985; Bowers and Taylor 1990). Borders between disciplines are very blurred in the health sector so service lines tend to reproduce similar patterns of care to functional structures.

   Do clinicians at WDHB think that service line restructuring will make a difference to the way they practice currently/refer or consult with other specialists? Will physical co-location of these specialties result in significant improvements to streamlining/coordination of care for patients? How much collaboration already occurs currently? (eg, multidisciplinary clinics, meetings) How freely/easily are referrals made currently? Will service lines result in real change to the patient

journey, or is it just an administrative rearrangement that will end up reproducing current practice?

4. Service lines generally envisage a dedicated (and therefore focused and efficient) staff. This may mean that some specialists become locked into a subspecialty eg an anaesthetist only doing joint replacements, general physician only seeing stroke patients. In this way, the service-line organisation may impede the specialist's breadth of clinical exposure as well his/her professional interaction with others of the same specialty. Do clinicians at WDHB perceive this would be a problem?

5. Considering choice of service lines to implement: what lines do WDHB clinicians think would be feasible? Consider which specialties they tend to refer to/work with on a regular basis; whether there would be adequate patient volume for a particular subspecialty line; is there a willing clinical leader available with suitable management training?

6. How will service line restructuring affect teaching at WDHB?

7. How do clinicians and other stakeholders feel about incentivisation at a public hospital – financial or otherwise?

8. There are significant potential costs associated with service line implementation – such as geographical re-location/new building; additional dedicated staff – dedicated clinical staff, 'patient co-ordinators' to coordinate the appointments for 'one stop care', on-site diagnostic services, additional layer of service line management, increased need for biostatistical information on customers, treatment patterns, prices and quality; provision of financial incentives; strategic planning involving external consultants. The literature suggests it could take 3 years before implementation costs are offset by cost savings elsewhere and/or increases in revenue.

   Is this affordable *without* reducing resources to less profitable services at WDHB, so that areas such as mental health do not 'lose out'?

9. A way of addressing inequality would be to have a service line dedicated to healthcare of a disadvantaged patient population (although this runs counter to the theoretical model as it is unlikely to be a profitable service). Could this be a feasible option?

Data measures of effect (performance indicators) that have been utilised elsewhere:

- Net revenue, profit margins before and after implementation
- Average length of inpatient stay
- Readmission rate within 30 days
- Number of patients treated (patient/case volume)
- Service line specific quality measures related to clinical outcomes eg, mortality for trauma
- Effect on teaching – changes in volume and breadth of teaching cases
- Effect on research opportunities – number of programs
- Patient satisfaction
- Provider satisfaction

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