

D- 3rd REVIEW

Applied state-of-the-action regarding PAC Rehabilitation quality-initiatives – A systems-based stakeholders' perspective

1- Review Introduction

As initially framed in our set of objectives, the draw of further preliminary recommendations should be made over the actual state-of-the-action, complementing and enhancing its scope, as well as promoting a good fit and synergic action among the initiatives yet undertaken or being prepared with what we will preliminarily recommend to advance the system of PAC Rehabilitation quality-initiatives. Therefore, knowing and being updated of quality-initiatives applied to PAC Rehabilitation field remains as a critical starting-point for drawing future-oriented preliminary recommendations.

2- Review Objective

The objective of this 3rd review is to outline and integrate the state-of-action of PAC Rehabilitation quality-initiatives.

3- Synthesis of Methods

The 3rd review, corresponding to our 3rd specific goal, had a particular process. It was made after the 1st and 2nd review, thus partly building and integrating references collected, and

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information organized and synthesized in the comprehensive process of the previous reviews. Due its positioning, it can be seen as an intermediate step between the previous supportive reviews and the later integrative preliminary recommendations, it-self integrating features abstracted from the different scopes of previous reviews. Finally, it used same underlying framework of the 2nd review for organizing the whole review process.

4- Review Results

The 3rd review results generally follow the same major organization and levels of the previous 2nd review

A) CONSUMERS LEVEL

We begin to shape the scope of consumers' perspectives and active roles for quality, similarly to the 2nd review, in case directly applied to PAC Rehabilitation scope, as well as also integrating many references and content collected and abstracted from previous the process and results of the previous reviews.

1) Patient- and Family-Centered Dimension of PAC Rehabilitation Quality

Patient- and broadly a family-centered dimension of care is one of the six dimensions of quality in general healthcare, as well as specifically applied to PAC Rehabilitation.

1.1 A change towards consumer-centered PAC Rehabilitation policies, systems, services and care

Consumers (patients and families) represent a stakeholder group with a pivotal role as source of definition and control for quality in general healthcare ^(1; 2; 3; 4), as well as advocated for PAC Rehabilitation ^(5; 6; 7). Patient-centered quality concepts/definitions represent the major rationale behind US policy reforms for PAC Rehabilitation ⁽⁸⁾.

Indeed, the US PAC Rehabilitation policy reform demands a transformational change in the way care is organized. Actually in the US, the PAC Rehabilitation care is made, quality-measured and paid differently at four different settings (e.g. hospital-based rehabilitation units/freestanding facilities; long-term care hospitals; home health agencies, or skilled nursing facilities - outlined in 'Background') with their own independent structural and regulatory requirements, and poor integration of PAC Rehabilitation services and care. It happens despite these different settings often can serve equivalent sub-populations needs, or forming an indivisible continuum of PAC Rehabilitation services and care ^(9; 10; 11).

The US organization of PAC Rehabilitation services and care is actually more provider-centered than patient-centered. Therefore, following the changing quality-perspective in general healthcare ⁽¹²⁾, the PAC Rehabilitation policy reform also demands a change towards a patient-centered quality perspective; re-organizing the PAC Rehabilitation services and promoting the development of uniform external systems that fosters the quality of care along the PAC continuum for individual patients and sub-populations ⁽⁸⁾.

More recently, the vision for patient-centered quality (and effectiveness/efficiency of care) was broadened to also aggregate in a same unit of payment previous acute care – creating new patient-focused acute episodes of care that also embrace PAC Rehabilitation ^(13; 14). However, by the other side, the benefit of bundling post-acute and acute care payments depends on the method used. Therefore, it can also threat patient-centeredness in the questions of patient choice for providers (later exposed in a further independent sub-section), which is precisely the contrary of what is the major rationale under the US PAC policy reform ⁽⁸⁾.

1.2 The unique/distinct quality perspectives of people with disabilities and PAC Rehabilitation consumers:

In this sub-section we argue, and support, about the distinct quality perspectives of people with disabilities, and then specifically PAC Rehabilitation consumers specific quality perspectives, reinforcing the need for a specifically designed patient-centeredness approach for people with disabilities, and ultimately PAC Rehabilitation consumers – the target population of this paper.

1.2.1 The quality of care from the disability's experience perspective

People with disabilities seem to have different quality experiences, expectancies and concerns as compared to non-disabled people. Indeed, compared to other people, people with disabilities are significantly more likely to be dissatisfied with their clinicians' focus on symptoms and diseases rather than overall health, participation, psychosocial issues and well-being status ⁽¹⁵⁾. Additionally, in compare to other sub-populations, people with disabilities reported more dissatisfaction with care for several quality dimensions. Indeed, regardless the underlying disabling condition, these people report poor communication and lack of thorough care, which leads to conclude the need for developing thoughtful systematic approaches to improve communication, comprehensiveness and coordination of care for these people along their continuum of needs, for beyond rehabilitative care ⁽¹⁶⁾.

Similarly, in a review of health services research, outlining a model of overall healthcare quality for people with disabilities ⁽¹⁷⁾, the authors identified several potential threats to quality of care for these people. It relates with clinical care, but it also relates access, experience, communication and coordination among multiple healthcare areas, settings and practitioners, as well as multiple social, vocational and community services that might be required to intervene with such population: a broader quality perspective that needs to be assured by those responsible to organize services and promote the quality along a comprehensive continuum of care ^(11; 18; 19).

1.2.2 The quality of care from the PAC Rehabilitation consumers' perspective

One of the underlying perspectives supporting the need to develop a PAC Rehabilitation specific quality framework (1st review) was precisely the notion that PAC Rehabilitation has a quite unique scope, paradigm, philosophy, framework and classifications that clearly distinguishes it from other healthcare areas.

The major goals and approaches of care are distinctive because the type of patients' needs addressed are also clearly distinctive from the needs addressed by other healthcare areas. Therefore, it is easily recognizable that the patient-centeredness of care - thereby PAC Rehabilitation consumers' perspectives of quality and patient-centeredness of care - would also have their particular scope ⁽²⁰⁾; as supported in our conceptual framework, and reinforced in the results of a recent empirical study ⁽²¹⁾.

A person facing the advent (often sudden) of a disability, remains struggling for adjustment and improved functionality/autonomy would have the perspectives for quality for what is a care of quality as compared to a person undergoing surgery (an opposite example). For instance, as Brook and colleagues exemplify ⁽²²⁾, while the second person would be more interested in the 'technical' quality of the surgeon, the first person might comparatively place an enhanced interest in the interpersonal aspects of care, such the ability to support struggling emotions.

The mentioned interpersonal aspects of care are themselves qualitatively different according to different healthcare areas, needs of sub-populations attended and specific process approaches ⁽²³⁾. The oncology and palliative care represent illustrative examples of healthcare areas in which this dimension has received differential value, training, assessment education or other type of improvement models and action, as we cite only few examples ^(24; 25; 26), recently reviewed ⁽²⁷⁾ exclusively for the oncology and palliative care field. The physical and mental suffering associated with treatment, life-threatening/disaster situations; or the eminent face of death are distinctive care features which need to be accomplished for a specific patient-centered interpersonal quality.

The same could be applied to the distinctive scope of overall quality - and specifically interpersonal quality - of PAC Rehabilitation care. Instead of a life-threatening situation or the eminency of death (like in oncology/palliative care); persons requiring PAC Rehabilitation care suddenly or insidiously stand in front of disability. The initial uncertainty about the grade recovery places even great psychological challenges for consumers, requiring practitioners' ability to manage expectations and the interpersonal

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relationship for a rehabilitative journey^(28; 29; 30; 31), which among other things may require re-define life goals, or at least re-define the way to achieve these goals^(32; 33).

In short, there is a unique and distinctive scope of the PAC Rehabilitation consumers' perspectives (patient-centered, but also family-centered^(34; 35)) for what represents a consumers-centered quality of care reflected in consumer-centered quality-initiatives.

1.3 Monitoring consumers-centeredness in PAC Rehabilitation: the lack of a specific tool

As outlined in the 2nd review, based in the consumers' experience concept, the Consumers Assessment Healthcare Providers Surveys (CAHPS) is the major program to monitor patient-centeredness in the US for different areas or settings.

As we begin to approach in the 1st review, in the family of tools (CAHPS website) we can find measures for specific levels of care in which PAC Rehabilitation care could be embedded, but none specifically for the scope of PAC Rehabilitation care as a whole. We can find in the CAHPS website specific tools for: hospitals (which can embrace in-patient rehabilitation units); a nursing homes measure for early discharged patients (which could embrace skilled nursing facilities); and also a measure for home health agencies (in which also PAC Rehabilitation care can be provided).

However, as told, none of these measures specifically reflect PAC Rehabilitation care after an acute episode. These measures are better seen as instruments for specific services type, but neither covering the scope of PAC Rehabilitation care, nor the PAC Rehabilitation experience as a whole – the basis of the policy reform⁽⁸⁾.

2) Engaging Consumers into their Actives Roles for Improving PAC Rehabilitation Quality

So far, we have been addressing the consumers' perspectives and experiences related with PAC Rehabilitation. From now on, in parallel with the 2nd review organization, we focus on consumers' active role for PAC Rehabilitation quality of care.

2.1 Engaging/Activating Consumers for their co-producer role in their own rehabilitation

As supported on the conceptual framework definitions, and specifically developed in the 1st review – part B, it is particularly important for the PAC Rehabilitation process and outcomes, the active engagement/participation of patients and families in their own rehabilitative journeys.

However, this is not an easy task for patients and families. Indeed, as the conceptual model begin to frame (and our further 4th review explicitly addresses), both patients and families need to pass through a psychological adjustment process regarding disability's losses^(36; 37); while at the same time directing focus and heavy efforts towards a demanding rehabilitation process and activities that try to minimize such potential disability: both tasks at the same time - a difficult psychological struggle^(38; 39).

Therefore, the personal ability of patients and families to direct efforts and energy constructively and fruitfully towards rehabilitation - instead of relying on guilty, escape avoidance, denial or other non-adaptive coping patterns⁽⁴⁰⁾ - would be critical for facilitating (or otherwise hindering) an optimal engagement into rehabilitation^(41; 42).

The active role for quality of their own care is a task for patients and families. But facilitating or 'activating'⁽⁴³⁾ an optimal psychological and social adjustment process, as well as the optimal rehabilitative engagement and active participation, is also a task for PAC Rehabilitation providers. Indeed, providers should adequately manage an interpersonal relationship/partnership (interpersonal dimension of care) not only for enhancing PAC Rehabilitation consumers' experience and patient-centered outcomes, but also 'activate' patients and families' engagement and participation for their own rehabilitative care, thereby enhancing functional outcomes achievement^(44; 45).

In addition, an adequate management of the communication and interpersonal relationship with patients and families might facilitate the psychosocial adjustment towards disabilities consequences - reflected in macro-outcomes such participation and quality of life. These are features addressed in depth by the 1st review – part B.

In a summary for being placed in such review, an adequate management of the interpersonal relationship would be reflected in a series or spiral or inter-linked benefits and

pathways for PAC Rehabilitation macro-outcomes' achievement with origin on a set of immediate and intermediate adaptive behaviors and its psychosocial determinants, representing consumers psychosocial and engagement variables that might be influenced by providers mostly through the interpersonal dimension of care.

2.2 Quality-informed choice for PAC Rehabilitation providers

Like any healthcare consumer (see the equivalent section in the 2nd review), also PAC Rehabilitation consumers must perform a role of for providers quality-informed choice. But such role for quality as employed by PAC Rehabilitation consumers could face enhanced restrictions. It happens mostly due two different reasons.

First, the field of quality-reporting as applied to PAC Rehabilitation is clearly under-developed, having very low specificity and validity on the ability discriminate quality of care among concurrent PAC Rehabilitation services and care. Additionally, when such information exists, it is presented mostly disaggregated by type of providers. Indeed, we the few quality-reporting initiatives existent initiatives are fragmented, confusing, non-understandable, and with low-comparable utility among other improvement needs ^(6; 46).

PAC Rehabilitation consumers often are unable to understand; as well as don not value the most quality-reported information in their choice process for providers. It results from a disconnection among what is reported and what consumers want to base their decisions. This is pointed for general healthcare ^(47; 48), as well as for PAC Rehabilitation consumers, which still tend to base their choice on informal sources and convenience ⁽⁶⁾. Lately within another stakeholders section (external/independent quality bodies) we approach the features of an enhanced PAC Rehabilitation public-reporting system.

A second threat to PAC Rehabilitation consumers' quality-informed choice, results from a yet unresolved feature of the upcoming advent of bundled payments - acute and post-acute care into a single payment. Many proposed bundled payment models have been associated with a loss of consumer's power in their decision for PAC providers ⁽⁴⁹⁾. Even if the bundle applies only to PAC, consumers may not be able to choose the next PAC provider ⁽⁵⁰⁾.

With such regards, it has been argued that today, in the US, there is no great freedom for consumers' choice for providers, with consumers just following the acute discharge

recommendations: thereby such feature of the bundled payment will not really change the actual scenario ⁽⁴⁹⁾. However, with such property remaining, these models undermine the potential of quality-informed choice for PAC providers: a major feature of the quality-movement rationale. But such quality-informed choice for PAC Rehabilitation providers almost does not exist today due lack on the reporting systems. Therefore, such reporting system and underlying sources must be first well-developed until we could be really become concern in resolving other models secondary features.

2.3 PAC Rehabilitation consumers and the quality-evaluator role

As outlined in the 2nd review, the PAC Rehabilitation consumers' evaluator role is critical mostly for the patient-centered dimension and outcomes of care, which is the case of satisfaction, or consumers' experience through CAHPS family of measures.

As already denoted, until now does not exist a CAHPS measure adequately covering the specific and whole scope of PAC Rehabilitation. Due such lack, PAC Rehabilitation consumers cannot adequately perform their evaluative role for quality - guiding new consumers' choice for PAC Rehabilitation providers.

The PAC Rehabilitation consumers' evaluator role for quality is typically confined on responding to non-uniform satisfaction questionnaires. Each provider uses their own-methods for measure, analyse and report satisfaction data ^(51; 52). The utility for improving systems-based quality with basis on such non-comparable quality data is quite limited. Providers could follow wanted policy for reporting data in the best of their interests. Moreover, satisfaction data reported by own-providers can give fallacious indicators of quality, since almost all providers report excellent levels of patients' satisfaction with their own services ^(51; 53), while quality gaps remain widely recognized.

2.4 Engaging PAC Rehabilitation consumers in quality and quality-systems defitions

As we already mentioned, one of the major reason for the lack of quality-informed decisions for PAC Rehabilitation providers remains on the disconnections among what is quality-reported and what information consumers want to base their decisions. A major

reason for that is the lack of consumers' involvement in making the definitions for quality and quality-initiatives, particularly these public-reporting systems.

In fact, it has been argued researchers and policy-makers are spending too little time on understanding what consumers value and want for and from PAC Rehabilitation services and care, thus what represents its quality ^(5; 6; 54). Indeed, despite some emerging initiatives, PAC consumers' perspectives are uncommonly called for a participatory process in PAC Rehabilitation ^(6; 55). Knowing what consumers want and value for their care represent a critical input for the PAC Rehabilitation quality-systems definitions; as broadly it would furnish a pivotal input for operationally define what is quality of PAC Rehabilitation care - a path to unravel the actual quality-misconceptions among different PAC Rehabilitation stakeholders – in the origin of PAC Rehabilitation 'quality paradox' phenomena ⁽⁵⁶⁾.

In summary, PAC Rehabilitation consumers must be early and broadly engaged in the task of defining PAC Rehabilitation services and care of quality, at least for consumer-centeredness. Consumers shall become involved in define the kind of quality they value and want to be reflected in quality-assessment, improvement and public-reporting initiatives: also the kind of information they want to compare for a quality-informed choice for health plans or providers, in case PAC Rehabilitation competitive providers.

B) EXTERNAL ENVIRONMENT LEVEL

At the PAC Rehabilitation external environment level we apply major features described for general healthcare in the 2nd review, as organized by the same stakeholder's groups, but in this case mostly using information applied to the specific PAC Rehabilitation scope.

1) PAC Rehabilitation Payers & Purchasers

We begin to outline the prevailing payment schemas for PAC Rehabilitation services; then we focus on the new proposed quality-aligned payment schemes – mostly those directly applied to the PAC Rehabilitation scope.

1.1 The actual Payment schemes: Prospective Payment divided by PAC type:

In the PAC Rehabilitation filed, there is actually prevailing a type of what was first conceived as a quality-aligned payment approach (better defined as an efficiency aligned-payment approach) introduced in the middle of the 90s. This is the Prospective Payment approach for Medicare beneficiaries. With such schema, PAC Rehabilitation providers receive an upfront payment for each patient, based on a category of their baseline severity/functional status.

In such prospective payment approach, the amount of upfront patient payments is the same for each patient group (baseline functional status and co-morbidities), independently of length-of-stay and services delivered. Therefore, providers are not stimulated for higher/unneeded length-of-stays for treatment or over-delivering services, which happened in previous schema of fee-for-service payments ^(57; 58; 59).

The amount of this fixed prospective payments are attached to the expected treatments, length of stay and expenses varying according to Functional Related Groups (FRGs) – similar to Diagnostic-Related Groups (DRGs) previously existing in acute-care - developed and calibrated on basis of large amounts of patients analyzed ⁽⁶⁰⁾.

It is easy to see the potential advantages the prospective payment systems (DRG-based in acute care; and FRG-based in post-acute) in terms of providing stimulus for greater efficiency and elimination of wasteful practices. However, there are also prejudices, which mostly resulted from natural attempts to maximize profits ⁽⁵⁷⁾. The pressure to early discharges in some cases passed important care needs for the next level of providers, it originated some important healthcare needs become unaddressed, as well as it increased the degree of preventable re-hospitalizations ⁽⁶¹⁾, which besides harming and attempting against patients health, is also an avoidable source of great healthcare expenses ⁽¹⁴⁾. Therefore even the efficiency of the system could be damaged such prospective payment system whose primary intents were to improve system efficiency.

In the case of post-acute care, there is another efficiency aspect that the prospective payment approach was not able to resolve. It results from the prospective payments being differently applied to different levels or settings providing PAC Rehabilitation. It does not

promote the use of the most efficient PAC placements, transitions, coordination and collaboration among different providers levels ^(49; 59; 62; 63). This is particularly relevant considering a lot of patients will make use of more than one this PAC Rehabilitation services and other subsequent care ⁽⁹⁾.

In order to address the limitations and negative implications of the actual prospective payment scheme, major payment changes involving PAC Rehabilitation have been proposed. We address the two most directly applied in the two following sub-sections.

1.2 PAC policy reform: envisioning a pay-for-performance (P4P) system

The US PAC policy reform has in the CARE tool under demonstration (<http://www.pacdemo.rti.org/>) a major basis for its application and effectiveness. In fact, one of the three major goals underlying tool development is to provide uniform baseline assessment for a uniform external follow-up quality/outcomes-monitoring for the whole PAC Rehabilitation continuum ⁽⁶²⁾.

Such external follow-up quality/outcomes-monitoring shall represent the major data-basis for future intended pay-for-performance schemes, rewarding PAC Rehabilitation providers with an additional payment that is based on patients' outcomes ⁽⁶⁴⁾.

Indeed, there are some consensus among PAC payment experts that fixed payments (even bundled payments, next addressed) should be complemented by a pay-for-performance component that mitigate those payment approaches limitations. According such same consensus, pay-for-performance system should have a predominance of outcomes over process measures, when properly measured ⁽⁶¹⁾.

1.3 Bundled payments

Bundled payments refers to one of the most representative innovative payments approaches that are being developed and discussed under an actual payment reform, and even the broader US health reform (14), therefore approached and compared with other innovative

payment approaches in our 2nd review (Payers & Purchasers). Herein, we re-approach the concept, but in case directly applied to the PAC Rehabilitation field.

Recalling, there are bundled payments options for chronic care, but also for an acute episode of care – including PAC Rehabilitation. There is more than a single possibility for operating bundling payments involving PAC Rehabilitation. It may for instance include a bundled payment for the all type of actually fragmented PAC Rehabilitation services - for instance the underlying payment mechanism suggested within the proposal of creating a Continuing Care Hospital as a way to aggregate PAC Rehabilitation services ⁽⁵⁰⁾ (later addressed).

Other option is to make a full bundled payment for all costs associated with an acute episode since disease onset. It includes at least the acute hospital care, PAC services, and perhaps also including outpatient and other follow-up needed services within a delimited period of time. Such last option seems to be a path to be followed at least in the medium or long-term, since it includes the optimization of the transition among acute, post-acute and other subsequent levels of an integrated care pathway ^(11; 18; 19; 65).

However, such option actually stands as more complex to technically develop and operate, so it is not to exclude that an intermediate bundled step may occur in a near future. All these options are proposed to be studied by the recent US health care reform law ⁽¹⁴⁾. After revealed the data of actually undergoing demonstration with the CARE tool, Post Acute Care Payment Reform Demonstration project (PAC- PRD), it will be up to the HHS US Secretary to decide to bundled option and operational features to follow to the Medicare program ⁽¹⁴⁾, which shall influence other payers.

A PAC payment experts' consensus raised concerns about specific features of bundled payments that engage PAC Rehabilitation ⁽⁶¹⁾. It relates with duration (generally told as 30 days) being proposed for an episode that may be not long enough for many conditions. The same PAC Rehabilitation consensus calls this period must be more carefully aligned with the natural history and trajectory of recovery associated with a given health condition or impairment. Another concern is that it could additionally originating shifting costs, as for instance expenditures from Medicare part A (e.g. in-patient and home-based PAC Rehabilitation services) for Medicare part B (e.g. outpatient rehabilitation therapy) with prejudices for the system and mostly patients.

Another major concern for the PAC Rehabilitation field relates with a question previously raised and addressed in the 2nd review. It relates with who will manage the ‘bundle’ and the care decision pathways: an ACO, acute hospital, continuing care hospital or other. Those small providers, particularly those at end of the chain of care (weaker decision power) could become financially threatened by the way bundling is implemented. Again, it will be up to the US HHS Secretary to take a decision that mitigates possible unintended consequences of this payment approach ⁽¹⁴⁾.

But despite concerns, there are also major opportunities bundled payments can bring to the most effective and efficient PAC Rehabilitation. Indeed, theoretically and optimally applied, bundling would foster coordination among providers and optimal transitions in time, and for the optimal level of care. It would avoid shifting needed interventions and costs for the next level of care (within the bundle), promoting optimal decisions and coordination for avoiding preventable re-hospitalization, as well as promoting a fundamental shift from a culture of care compliance to a culture of innovation and best-practices along the PAC continuum ⁽⁴⁹⁾.

In addition, bundled payments can create new opportunities to revisit the large, if not stifling, regulatory regimes that had emerged to mitigate the unintended consequences of current payments systems. Presumably, if the incentives are aligned correctly across sectors and providers, there should be less need for back-stop or impeditive regulation ⁽⁶¹⁾: a matter for instance highlighted in the last Public Policy section.

2) PAC Rehabilitation External/Independent Quality Bodies

We now address the aspects related with the activity of external/independent quality bodies, with specific action over the PAC Rehabilitation scope.

2.1 Organizational quality-assurance: PAC Rehabilitation services accreditation:

Accreditation by external entities assures healthcare organizations/providers comply with a set quality and safety standards, mostly at structural/organizational level. Despite not

obligatory, accreditation is becoming progressively tacitly required at least to gain access to contracts with payers ⁽⁶⁶⁾.

Most representative accreditation entities in the PAC Rehabilitation are ‘The Joint Commission’ and ‘CARF – Commission for Accreditation Rehabilitation Facilities’. The Joint Commission (www.jointcommission.org) - in Background and 2nd review - is the accreditation entity with the more generalized scope of action. For PAC Rehabilitation, it can provide accreditation mostly to hospital-based rehabilitation facilities, and also home health care entities. The Joint Commission also provides certification of disease-specific care programs, including stroke rehabilitation and orthopedic joint replacement.

By its turn, CARF (www.carf.org), in Background, is the accreditation entity more specifically targeting rehabilitation. In fact, CARF provides accreditation services to organizations and providers within the health and human service sectors, whether it is rehabilitation for a disability, treatment for addiction and substance abuse, home and community services, retirement living, or other health and human services.

Specifically for rehabilitation units, CARF establishes the minimum standards, mostly structural for quality. For instance, concerning staffing, CARF standards relate with per-patient ratios by discipline, complementary of technicians, and ratios of certified professionals per bed. CARF also requires that a medical directorship of a hospital-based rehabilitation unit to be a psychiatrist or a physician with proved (as they define) experience in rehabilitation; as well as CARF also expects that organization fosters a structure for family conferences, at least once during patients’ stay, envisioning education and later discharge planning and recommendations for patients and families.

These examples mostly fall in the structural axis of the Donabedian quality framework, the traditional field of activity for the accreditation entities. However, mostly in the last decade, accreditation process has been evolving to also include a more critical focus in clinically-nature processes and outcomes of care.

For instance, hospital-based rehabilitation outcomes are addressed by the The Joint Commission, which mandates the use of ORYX indicators (the joint commission performance measurement set) that includes: percentage of patients discharged to home, average length-of-stay, functional independent measure gain/efficiency per day, cost per stay, percent discharged to acute care, and a case-mix index which of associated risks and

co-morbidities for adjusting outcomes-benchmarks. Such type of quality/outcomes information is used not only for accreditation purposes but also for public reporting.

2.2 External Performance/Quality Measurement and Reporting System

The quality-reporting system in PAC Rehabilitation is far from being optimal. In the following sub-sections we'll further address the major causes of the subject.

2.2.1 The need for a uniform PAC Rehabilitation system

As a consequence of the actual fragmentation of PAC Rehabilitation services (Background), the performance measurement system and subsequent external quality-mechanisms for PAC Rehabilitation (public-reporting and pay-for-performance systems) appear also disaggregated by PAC settings. These settings have their own independent quality-monitoring system, based in different sets of assessment measures (quality-indicators), for instance required to come with claims data (e.g. Medicare); or resulting from specific accreditation programs (e.g. ORYX from the Joint Commission).

In the actual scenario, PAC Rehabilitation services can only become compared in their performance with others of same type, and not across the full spectrum of PAC Rehabilitation services. Such prevailing system is more provider-centered than really patient-centered (consumers level). Mitigating fragmentation among PAC Rehabilitation services, the yet mentioned CARE tool will facilitate appropriate placements, transitions, and outcomes/ performance monitoring in fixed dates, tracking patients' evolution across time despite settings⁽⁶²⁾.

Uniformly applied to all PAC settings, the CARE tool represents a common-basis for the implementation of performance measurement and public-report system according to patients' needs, irrespective of providers' type. This is what is called as a patient-centric performance measurement instead of provider-based, also fostered in general healthcare⁽¹²⁾, beginning to address gaps in the PAC Rehabilitation quality-initiatives: lack of a uniform external system to: measure, collect and report quality/outcomes data⁽⁶⁷⁾.

2.2.2 Performance Measurement: the role of outcomes-monitoring

The outcomes-monitoring at follow-up as a component the CARE tool fully employed would represent a privileged data-basis for quality/performance measurement; therefore the subsequent public-reporting and also quality-aligned payment mechanisms. Such outcomes monitoring shall be promoted by an external/independent entity - yet to be determined - assuring fairness and rigor of the process⁽¹⁴⁾.

The great added-value of outcomes-indicators (in comparison to structural and process indicators) is that it reflects and integrates all productive processes. This is valuable for any healthcare area, but even more for PAC Rehabilitation with multi-determined outcomes (biopsychosocial, ecologically and inter-disciplinary-determined), achieved through complex processes not yet completely dissected on its specific active ingredients: a phenomenon called as the rehabilitation 'black-box'^(68; 69).

The field of outcomes assessment has received tremendous input in recent years, also applied to PAC Rehabilitation, particularly in terms of advancing assessment capacity: producing tools that are valid, reliable and yet feasible for routine outcomes-monitoring. The computer-adaptive testing (CAT) methodologies - based in the Item-Response Theory (IRT)^(70; 71; 72), as an alternative to classic testing - is allowing for assessing very complex constructs with a minimized number of adaptive items that are scored in a same metric, significantly reducing the assessment burden, without compromising validity and reliability, becoming suitable for the complex and multi-determined PAC Rehabilitation outcomes/quality-measurement⁽⁷³⁾.

Illustrative applied examples (although not exclusive) of these valid, reliable yet feasible assessment tools, CAT-based, are the Activity Measure (AM-CAT)⁽⁷⁴⁾ and the Performance Measure (PM-CAT)⁽⁷⁵⁾. Such type of measures were recommended as suitable for measuring functional performance (activity and participation) within the time restraints of a routine follow-up outcomes-monitoring⁽⁶²⁾. The recent Patient-Reported Outcomes Measurement Information System (PROMIS), also CAT-based, has a social domain that applies to participation measurement⁽⁷⁶⁾. However the question if participation is a suitable construct for IRT-based instruments is still a discussing matter^(77; 78). This is an actual active field of rehabilitation research, further addressed.

The PROMIS as a whole broadly embrace a self-rated quality of life (QoL)-related content ⁽⁷⁹⁾ - which is also recommended as a domain for being monitored for quality-purposes ⁽⁶²⁾ – however applying the whole of its domains makes the task less feasible for routine follow-up quality assessment. Taking benefit of specific population tools using CAT methodologies, the recently developed Neuro-QoL (www.neuroqol.org) - even if the primary focus envisions research goals - could represent a starting-point for developing a comprehensive yet brief QOL quality-monitoring tool, that is specific and sensitive to these typical PAC Rehabilitation populations ⁽⁷⁷⁾; as the own families, relatives or caregiver QoL should also be a matter of interest for many rehabilitation cases as outlined in our conceptual framework (1st review).

2.2.3 Outcomes-indicators: disadvantages for quality-monitoring

As told, outcomes monitoring, due the highlighted potential advantages, shall represent, in medium or long-term, the core of PAC Rehabilitation performance/quality measurement systems, public-reporting and pay-for-performance. But actually, there are some applied difficulties, mostly of two types: first the technical difficulties; and second the comprehensiveness of a set of outcomes that also need to be feasible.

The technical difficulties relate with non-optimally matured case-adjustment mechanisms that, although have been received important developments, like the FIMTM-functional-related groups (FIM-FRGs), it is still far from being optimally achieved ^(67; 80). In PAC Rehabilitation, it relates not only with difficulty in controlling external variables such severity, age or co-morbidities (in case for instance cognitive impairment) but also a series of psychological and social variables configuring a multitude of variables interfering with care ⁽⁶⁹⁾. These technical difficulties need to be adequately addressed so best outcomes scores represent the best quality of care ^(67; 80).

The second difficult point is the ability to develop a comprehensive, yet feasible, set of outcomes measures for the complex scope of PAC Rehabilitation. Indeed, not only the use of valid, reliable and feasible outcomes measures is sufficient for the effectiveness of a monitoring system. It needs also to be sufficiently comprehensive in order to critical aspects and aims of PAC Rehabilitation care becomes reflected at least in one measure-type. Otherwise, all the subsequent quality-initiatives will be reinforcing the so-called

‘unintended consequences’ it brings ^(81; 82; 83). It means other type of care aspects, not quality-monitored, are stimulated to become out of practice.

In our conceptual framework (1st review, and its later specific discussion), we mention the inclusion of other complementary macro-outcomes’ dimensions (e.g. applied consumers’ experience and family QoL for certain cases – yet actually with no existing suitable tools) in a set of measures for uniform macro outcomes-monitoring. Certainly, enlarged consensus should be built also in that matter for achieving matured external system of quality/performance measurement, representative, yet feasible to be applied.

2.2.4 The complement of process-monitoring

In fact, despite the advocated promise of outcomes-monitoring for an external PAC Rehabilitation quality/performance monitoring system, there is also the need for complementing information from other type of performance sources that do not rely exclusively on outcomes. This is the case of process-monitoring.

Process-monitoring - which is evaluating compliance with quality-measures/indicators that reflect critical elements of the care process - can represent a critical source of information of an external performance/quality monitoring system, by two reasons.

A first reason relates with the actual technical difficulties in the case-mix adjustment process already mentioned. The use of process-indicators is an alternative or complementary source of quality-information. Process-indicators are particularly valuable in cases of solid/unquestionable evidence about easy-measurable aspects of care producing better outcomes for a defined set of circumstances ⁽¹²⁾. However PAC Rehabilitation holds a very complex/multidimensional process and determinants ⁽⁷³⁾; as well as there is yet a lot of ‘dark room’ in the ‘black box’ of the rehabilitation process and its inherent complexity ⁽⁶⁸⁾, which makes clearly more complex the task of clearly defined process quality-indicators.

But even increasing the scientific, granular knowledge, of the rehabilitation active ingredients - actual research trend ^(84; 85) - it is unfeasible for an external monitoring system to become exclusively based on an infinite number of granular process-measures. Additionally, it does not capture the synergic and integrative effect of the rehabilitation whole process, as it could be made by outcomes-monitoring ^(49; 67).

Therefore, integrating advantages and disadvantages of each other, is the policy option for PAC Rehabilitation quality/performance monitoring system, envisioning an emphasis in outcomes-monitoring, as complemented by process-monitoring ⁽⁸⁾.

As second reason calling for the use of process-monitoring, as a complement of outcomes-monitoring, is the fact that any performance/quality monitoring system should have the ultimate aim of facilitating quality-improvement. Indeed, even if an outcomes-monitoring system was sufficiently comprehensive and sensitive to serve as basis for quality-reporting, benchmarking and quality-attached payments; it would not exactly provide input in what aspects of process went wrong, or could be optimized, for achieving the 'best-in-class' performance in outcomes measures.

The value of getting an external complement of process-monitoring information, which would be reinforced by internal/organizational information system, will be therefore critically in defining process targets for internal quality-improvement initiatives, improving processes of care that originated suboptimal outcomes. Without such complement of process-monitoring it would be difficult to know the determinants of the sub-optimal outcomes and address them by quality-improvement ^(73; 86).

2.2.5 Public-report of quality-information

As we begin to outline in this section, there is not yet a uniform system for measure, collect and report outcomes/quality-data in PAC Rehabilitation, and this is a great need for PAC Rehabilitation, receiving an important activation input from the CARE tool.

So far, outcomes information is not routinely shared with rehabilitation stakeholders (i.e. payers and consumers), despite rehabilitation providers and industry stakeholders generally express favorable attitudes towards public disclosure of outcomes information ⁽⁶⁷⁾; but there is no system of PAC Rehabilitation uniform quality-reporting.

The Centers of Medicare and Medicaid Services (CMS) disseminates quality-information on Skilled Nursing Facilities (SNFs) through the Nursing Home Compare website (<http://www.medicare.gov/NHCompare>), but these measures do not adequately reflect the quality of PAC Rehabilitation care provided at these settings, for instance because the system is non-predicting for the quality of rehabilitation outcomes ⁽⁴⁶⁾. Similarly, for stroke

conditions, it was found that public-reporting is incomplete, confusing, and inaccurate, which may lead to more prejudices than benefits of a quality-reporting initiative with such characteristics⁽⁸⁷⁾.

Indeed, consumers do not base their choices in the available quality-information, often relying on informal information-sharing, as well as on convenience or other non-quality-related factors (consumers level). Great causes of it, heavily fostered in the 2nd review, is a lack of knowledge of availability of such information; lack of adequacy, organization and lack of easy-digestible information for all health literacy levels; as finally the lack of value for consumers of information contained in these mechanisms.

Public-reporting of PAC Rehabilitation quality data is nascent; therefore we stand for a unique opportunity to develop a quality-reporting system that is meaningful, comprehensive and easy-digestible (for all health literacy levels) for all stakeholders, including the consumers⁽⁶⁾. It should require integrate stakeholders perspectives (consumers in a pivotal role) early and on-going in the development of these systems⁽⁵⁵⁾.

3) PAC Rehabilitation Suppliers

There are continuous technological advances that are specifically applied to rehabilitation, for instance engineering applied advances and innovations that can be developed (often in close collaboration with the research community) and furnished by suppliers to elevate the standards of PAC quality⁽⁸⁸⁾.

However, following the same rationale of the 2nd review, in this section we remain particularly focused on HIT supplying PAC Rehabilitation and broadly supporting coordination of care after acute episodes it could enhance: a major US priority⁽¹⁴⁾.

3.1 PAC Rehabilitation HIT supplying

Due population covered (e.g. above 65 years), Medicare and public programs represent the great payers of PAC Rehabilitation. Therefore, the Centers of Medicare and Medicaid

Services (CMS) actual regulatory definitions, payment schemes, claims and other administrative requirements serve as the gold standard for the development of HIT supportive tools - actively designed to help PAC Rehabilitation providers to comply with CMS regulations and the business model subsequent to CMS payment schemes⁽⁴⁹⁾.

The 'Uniform Data System for Medical Rehabilitation' (www.udsmr.org) is the supplying software that achieved wider implementation in the PAC Rehabilitation market along years, furnishing software and tools as divided by different PAC settings (reflecting CMS's disintegrated PAC regulations and assessments). Only more recently, the mentioned software received more serious competition from the 'erehabdata' (www.erehabdata.com), as commercialized by the American Medical Rehabilitation Providers Association (AMRPA).

Both are able to record and upload data to central databases providers are engaged with (e.g. CMS, The Joint Commission), with a primary aim of supporting the accomplishment of regulatory, accreditation, claims and billing data, but also containing some elements that can be used for quality-monitoring, health-services and outcomes research. For instance, the use of one such large databases, in case the 'Uniform Data System for Medical Rehabilitation', provided critical data for development of actual prevailing PAC Rehabilitation mechanisms such the previously mentioned Functional-Related-Groups (FRGs) that technically allowed the introduction of the Prospective Payment System for PAC Rehabilitation⁽⁶⁰⁾.

These software system, assuming a role as a quality-reporting system, are being also able to facilitate benchmarking, allowing subscribers to timely compare their performance and results against peer performance in major outcomes (e.g. Functional Independent Measure or discharge destination) and other factors such length of stay.

With an widespread implementation of the new uniform CARE tool (uniform across PAC settings) and presumably the introduction of bundled payments among acute of and post-acute care, the major focus of the activity of these and mostly other software vendors for the PAC Rehabilitation scope would change from help providers to comply with complex site-specific regulations, administrative and billing requirements, towards a more value-based enhancement perspective - helping providers in a renewed task of achieving quality and efficiency of their practices along acute episodes of care^(49; 89).

The yet mentioned web-based CARE tool, which can also be seen as a supportive software tool, has among its major features the underlying intent to facilitate acute discharge placement and transitions among PAC levels. The tool will be able to collect and share a set of needed uniform information that will be web-accessible to the next level of PAC Rehabilitation care, thus avoid lost of information in transition ^(62; 63).

Beyond the CARE tool, there is still room for more specific interoperable systems that enable communication and coordination of care. It could happen within the same healthcare organization for highly complex cases requiring care from a wide-spread resources and specialists, including PAC Rehabilitation: an example is the Veterans Health Administration Polytrauma communication and coordination system ⁽⁹⁰⁾.

But software systems can also be supportive of taking the optimal decisions for care, such ideal timing and place to discharge or transfer patients. An example is a software that is able to support evidence-based decisions at the interfaces is the 'Inter Qual' tool ⁽⁹¹⁾, which can facilitate research on such matters become reflected in aids and guidance for timely and efficient placements and transitions. Applied into independent research in Australia, this tool suggested earlier discharges for Australian practitioners' clinical reasoning, indicating the tool is calibrated to reflect the profit pressure for early discharge in the US ^(92; 93).

Finally, specific software systems can be developed for practice-data recording (at the point-of-care) and later analysis even for internal/external quality-monitoring systems, or for practice-based research, as for instance applied in SCIREhab project ^(84; 94).

4) PAC Rehabilitation Research Community

We specifically address the features of PAC Rehabilitation research community with more applications to the issues of PAC Rehabilitation quality and quality-initiatives.

4.1 Health-Services Research

We become to analyze the themes under PAC Rehabilitation health-services research.

4.1.1 Impact of Payment Reforms

A major trend for PAC Rehabilitation health-services research relates with track the multitude of health-services effects/impacts that occurred after the implementation of the US prospective payment system (PPS) for the different PAC settings.

With such regards it was verified that payment-systems incentives indeed play a significant role in determining whether and where Medicare beneficiaries receive their post-acute care, diminishing the length of stay in targeted-sites and boosting the use of alternative setting - a typical feature of shifting costs and risks to the next paid level⁽⁹⁵⁾. The evidence at this level - analyzing the different times of PPS introduction for the different PAC type of settings - strongly suggests the substitutability within PAC settings. It also shows these financial incentives (in addition to clinical needs and preferences) play a major role in determining the timing and amount of PAC use⁽⁹⁶⁾.

Besides payment considerations, applied health-services research also found significant interference of availability of PAC services determining PAC services use as compared to clinical determinants, which revealed a strong supply-driven demand - similar to general healthcare⁽⁹⁷⁾ - which could potentially leads to unwarranted expenditures of resources and delays in returning patients to their homes as a desirable outcome⁽⁹⁸⁾.

The impact of the PAC Rehabilitation PPS was target of studies by PAC settings-type^(99; 100; 101); including activity of different rehabilitation professionals^(102; 103). Among findings, studies revealed change in therapies patterns - diminishing therapy resources in severe cases^(99; 104); in some cases, but not always, shifted to moderate severity cases⁽⁹⁹⁾. Such shifting trends reinforce the need to include a component of quality/outcomes-based reimbursement to avoid prejudices from pressures to early discharges⁽⁶¹⁾.

With the further bundled payments for episodes of care, it is expected another wave of impact-based health-services research would follow it; probably with a renewed focus on the ideal intersection among acute, post-acute and other subsequent services⁽⁶¹⁾.

There are few published studies analyzing the ideal timing for transfer patients from acute to post-acute and subsequent services^(93; 92; 105). With a new payment schema, certainly there will be an increased focus on aspects like these, relating with innovations for seamless

transitions, coordination of care, quality and global efficiency of healthcare services beyond the ‘silos’: type of PAC and other healthcare settings ⁽⁴⁹⁾.

4.1.2 Health-services characteristics (structure) supporting quality process and outcomes

Another PAC Rehabilitation health-services research line placed focus on determining the health-services characteristics (structure) better supporting quality processes.

Such research-line can be framed under the light of the Donabedian S-P-O model (Background). Hoenig and co-workers developed a sequence of studies fitting with the mentioned regards. In such sequence, it was first carried out a systematic review of the literature, using the Donabedian model, organizing the specialty-literature abstracted into sub-categories of structure, process and outcomes ⁽¹⁰⁶⁾. In a second study it was developed a Donabedian-based taxonomy of rehabilitation services ⁽¹⁰⁷⁾. Such taxonomy was used for investigations showing that, for stroke rehabilitation, structure of care (facilities characteristics, types of personnel) were able to predict process of care (multi-disciplinary team meetings, care planning). In turn process of care predicted outcomes, with structure affecting outcomes mostly through mediation on the process of care ⁽⁸⁶⁾.

Following studies in the same sequence associated better process of care with better functional outcomes ⁽¹⁰⁸⁾, as well as patient satisfaction as outcomes of relevance ⁽¹⁰⁹⁾. Such research line, supported by more recent data ⁽¹¹⁰⁾, informs managers, payers and policy-makers on the suitable health-services characteristics for quality of care ⁽¹¹¹⁾.

4.2 Outcomes Research

Apart from health-services research, focusing on external and macro-system structures, the outcomes research focuses on find the specific processes determining enhanced outcomes, as controlled by other factors and conditions influencing outcomes: personal factors, case-severity, co-morbidities and other external or environmental factors. It looks for determine the ‘active of ingredients’ of care, a major research concern ⁽⁶⁹⁾.

As outlined in different places along paper, PAC Rehabilitation field is actually a ‘black box’ that shows effectiveness as a whole. However, there is very little solid knowledge of the ‘active ingredients’ within such ‘black box’, creating a research focus for determining the granular aspects of care associated in the best outcomes^(68; 112).

Such ‘active ingredients’ within complex rehabilitation interventions⁽¹¹³⁾, do not exclusively relate with specific content of care, but rather a mix of it, and amount and timing. For instance, despite caution recommended in translate these results⁽¹¹⁴⁾, it seems that in stroke-rehabilitation earlier and more ‘aggressive’ intervention could achieve higher/efficient improvements in stroke rehabilitation^(115; 116).

Outcomes research development is intrinsically dependent on the advancements assisted in the outcomes measurement capability (later addressed). The development of health-services and outcomes research as applied to PAC Rehabilitation is also dependent of advancing the critical mass of human resources to perform the critical US health-services and outcomes research agendas to inform policy and practice (<http://www.feinberg.northwestern.edu/ihs/education/post-doc/>).

4.3 Comparative Effectiveness Research (CER)

In complement to health-services and outcomes research, there was more recently an emphasis in determining the comparative effectiveness of different healthcare alternatives to outline the most cost-effective solutions for different sets of patients’ conditions – Comparative Effectiveness Research (CER) in the 2nd review.

In PAC Rehabilitation, some of these questions are research priorities for some time. A major example is the question of the most cost-effective option to treat typical PAC Rehabilitation populations (stroke and joint replacement) in more expensive acute rehabilitation settings such in-patient rehabilitation facilities (IRFs), or in comparatively cheaper sub-acute rehabilitation setting such the skilled nursing facilities (SNFs).

4.3.1 Acute rehabilitation setting (IRFs) vs sub-acute setting (SNF)

In post-stroke rehabilitation there is a landmark study finding out if the more costly and intensive IRFs resulted in higher functional outcomes compared with SNFs. In the study, IRF and SNF outcomes were similar for patients with minimal motor disabilities and patients with mild motor disabilities and significant cognitive disabilities; thereby these patients would be indicated for sub-acute programs due the lower costs⁽¹¹⁷⁾.

The same research-team also analyzed the same problem for hip fracture rehabilitation. SNF-based rehabilitation was less costly and outcomes were in most instances similar or even better than IRF-based rehabilitation, thereby suitable for the typified cases⁽¹¹⁸⁾.

More recently, a comprehensive study originating a series of publications from DeJong and colleagues, provided these type of answers for joint replacement rehabilitation, comparing the services provided⁽¹¹⁰⁾, outcomes at discharge⁽¹¹⁹⁾, long-term outcomes⁽¹²⁰⁾, and utilization resources uses⁽¹²¹⁾.

In terms of Long-term outcomes, the study shows a modest advantage for IRF in motor functional and health status gains for hip replacement, yet showing no differences for knee replacement⁽¹²⁰⁾. In terms of other resources use (further rehabilitation and other healthcare services), it was revealed that patients discharged from both settings received considerable amount of follow-up care, which highlights the need to look also comprehensively ahead of post-acute setting on costs and resource utilization (121).

By characterizing services, the study was able to determine the difference in the therapy patterns, and in the length of stay (LOS) - showing greater variation among SNFs than among IRFs, which had shorter and less variable LOS, more intensive therapy and provision of more occupational therapy⁽¹¹⁰⁾.

After DeJong and colleagues' study, the same subject was addressed in another study - but only with functional outcomes as focus - in case also considering home-healthcare option. It was found direct discharge to home care was the optimal strategy for patients after total joint replacement surgery if they were healthy and had social support. While for sicker patients, availability of 24-hour medical and nursing care may be needed, but intensive therapy services did not seem to provide additional improvement⁽¹²²⁾.

Beyond settings, there is important to look beyond towards gaining understanding of the elements within settings enhancing outcomes – the active ingredients⁽¹¹¹⁾.

4.4 Research using routine PAC Rehabilitation practice-data:

There are some problems with the implementation of rehabilitation Randomized Controlled Trials (RCTs) that relates with the large number of people excluded from trials; small number of people with some neurological conditions making RCTs non-viable; or even some apparent difficulties in using randomization to allocate subjects to alternative treatments^(123; 124). In addition, there is not enough money or time to examine each treatment step or combination of treatments exclusively using RCTs, which cannot provide comprehensive information about the interaction among treatment variables in complex interventions - just one intervention or one set of interventions tested.

Finally, due the RCTs sample selection restrains, their findings have no external validity for patients with co-morbid and multi-determined conditions, and less when treated by concomitant multi-disciplinary interventions of PAC Rehabilitation^(125; 126). Thereby, other research-design alternatives might also play a significant role for the enhancement of PAC Rehabilitation evidence knowledge⁽¹²⁵⁾.

4.4.1 Practice-Based Evidence (PBE) methodology

Practice-based evidence (PBE) methodology (or clinical practice improvement studies), provide information about the effectiveness of multiple and complex combinations of interventions in real-practice with heterogenic patients and heterogenic practices^(126; 127).

Routine practice-data about patient, process and outcomes variables could be comprehensively and uniformly collected, registered, stored and processed in a central database. Indeed, it is possible to use heterogeneity of practice-based data (characteristic of PAC Rehabilitation care) to produce practice-based evidence and comparative effectiveness research (CER) for alternative care-pathways, highlighting the most effective/efficient patterns of care^(84; 127; 126).

The evidence coming from RCTs is still advocated as a major approach for the rehabilitation research^(128; 129). However, PBE methodology does not aim to replace RCTs. Indeed, the best answers about how to enhance rehabilitation outcomes would be likely to come from a combination and integration of RCTs and PBR/E methods^(123; 130), since PBE/R methods can be used both as hypothesis-testing, as hypothesis generation for the heavy and more costly RCTs to test⁽¹²⁶⁾. In summary, RCTs and PBE/R can respectively become the ‘red highways’ and the ‘blue highways’ in their complementary roles in a rehabilitation research roadmap⁽¹³¹⁾.

The PBE methodology was used in two major studies of PAC Rehabilitation, in case applied to stroke rehabilitation⁽⁶⁸⁾, coming to results challenging conventional wisdom such as the earlier and more aggressive therapy producing better results even in more severe patients⁽¹¹⁶⁾; and applied to spinal cord injury yet to present final results^(84; 112). There is also in progress a study for traumatic brain injury rehabilitation⁽¹²⁶⁾.

Inherent to the PBE methodology, there is a need for a great and early active involvement of reference practitioners on different study sites. Such involvement is needed to: define questions and hypothesis to be tested; define possible confounders, patients, outcomes variables to be included; define possible actionable treatment variables⁽¹²⁷⁾, define comprehensive treatment taxonomies; as well as to define the collection process, including the documentation and *modus operandi* of registering information at the point-of-care (POC) for each rehabilitation discipline^(85; 94).

Critically, there was a need to develop taxonomy of multidisciplinary professionals’ interventions because of a previous absence of uniform or widely recognized classification of intervention for the professions involved. Such absence – contrasting with the classification for general nursing activities - is pointed as a major gap the rehabilitation field needs to address. We are unable to determine the active ingredients if we are unable to classify them⁽¹³²⁾.

The involvement of providers in study definitions, and the results revealing real-world interventions effectiveness (and mostly interventions combinations) on multiple sub-sets of real-world patients, might promote compliance with study requisites, and later uptake of the conclusions – the ultimate research intent^(94; 127). For instance, effective uptake or adoption of a PBE study conclusions in long-term care improved in up to 65% the prevention of

ulcers pressures development, which is a very interesting number for predictive validity of the methodology in terms of practice improvement⁽¹³³⁾.

4.4.2 PAC Rehabilitation Practice-Based Research Networks (PACR-PBRNs)

PBE studies in the PAC Rehabilitation already done^(68; 112) - as on-going mentioned PBE study for traumatic brain injury rehabilitation - represent illustrative examples of Practice-Based Research Networks (PBRN) - or in other words PAC Rehabilitation Practice-Based Research Networks (PACR-PBRNs).

Indeed, the studies occurred in multi-site practices, distant in geography, with the support researchers within these sites, and an overarching central methodological support for overall research planning, development analysis and reporting of results and conclusions - yet in close collaboration with leading practitioners in the field.

Despite established across sites distant in geography, those networks were aggregated by the content: rehabilitation of a condition. Many other contents or more specific contents within the rehabilitation of these conditions (e.g. a particular functional-related group^(134; 135); cognitive, psychosocial, vocational aspects of rehabilitation, among many others) could represent a content aggregator for more fruitful PAC-PBRNs become established in a long-term, in order to develop other or more focused PBE studies helping to open the rehabilitation 'black-box'.

As the era of electronic records become widespread, it is easier and even less costly to develop such PBE studies in networks. For large sample sizes it costs about 20 times less than RCTs), without necessarily causing disruption in the routine practice⁽¹²⁶⁾.

PAC-PBRNs could develop studies not only on a PBE basis, but also for instance about testing the introduction of innovations into practice, for instance using practical clinical trials^(136; 137); or developing knowledge from best practices research⁽¹³⁸⁾, or being more actively involved in developing practice-improvement solutions with suppliers (e.g. HIT) and consumers, as outlined in the 2nd review.

4.4.3 Rehabilitation Research Using Practice-Data from Large Databases

Using yet existent central databases for health-services and outcomes-research purposes is a developing trend in PAC Rehabilitation research. For instance a great purpose for ‘The Center for Rehabilitation Research using Large Datasets’ (<http://rehabsciences.utmb.edu/r24/welcomeVideo.asp>) is to train rehabilitation outcomes researchers in the intricacies of working with an estimated 30 to 50 large rehabilitation databases sub-optimally addressed by secondary research analyses.

One of the major databases is the Uniform Data System for Medical Rehabilitation (UDSMR), being the source for many wide-scale rehabilitation studies yet developed. For instance, UDSMR-based benchmarked information, compared along time, is periodically used on rehabilitation outcomes research on treated conditions such: hip fracture ⁽¹³⁹⁾, traumatic brain injury ⁽¹⁴⁰⁾, or stroke ⁽¹⁴¹⁾.

4.5 Measurement capability

Enhancing the measurement capability mostly for outcomes research is a major active research field. It is expected that with adequate measurement of the major rehabilitation outcomes it is possible to develop studies looking to define the most active ingredients of PAC Rehabilitation for different sub-set of rehabilitation populations.

Many valid and reliable instruments exist for this area, but it is intended the development of ‘gold standard’ instruments that are not only valid and reliable, but also sensitive to treatment differences, feasible in routine practice application, and able to achieve conceptual, operational and measurement properties for uniform use across sites, studies and quality-initiatives, favoring comparability of results.

The FIMTM instrument comes close to a ‘gold standard’ in rehabilitation for measuring the levels of functional recovery in motor and cognitive domains, fitting within the concept of Activity (1st review), being often a primary outcomes measure used in rehabilitation studies. However, a more recent CAT-based instrument is already available towards measuring activity ⁽⁷⁴⁾.

With regards to Participation measurement, despite existence of many instruments, yet systematically compared with each other^(142; 143), there is however a lot a more controversy in conceptual delimitation, operationalization and therefore measurement within such construct^(78; 144; 145). This is an issue the International Classification of Functioning⁽¹⁴⁶⁾ is not able to resolve due the ambiguous operational distinction among Activity and Participation^(147; 148; 149).

For instance, there is some controversy in the appropriate measurement approach for Participation, underpinned in some doubts about the ability to consider the construct in psychometric and hierarchic terms, or mostly in a clinimetric perspective, or even by conceptualizing it in its objective and subjective/perceived dimensions^(76; 77; 78); with more recent efforts to achieve more consensual measures^(150; 151; 152).

5) Rehabilitation Educational Community

The role of education entities for quality of care - those educating rehabilitation providers - is not much different of those mentioned in the 2nd review for general healthcare. For instance, taking the example of medicine and the psychiatrists' residency training, they follow the same input for the accreditation of medical residency programs - six ACGME competencies⁽¹⁵³⁾. The physical medicine and rehabilitation residency programs try to adapt activities to fit the transversal ACGME requirements.

Adaptation has been seen particularly directed towards the typically less addressed ACGME domains - domains in actual great need for a quality transformational change - meaning the practice-based learning and improvement, and the systems-based practice domains. Physical and medicine and rehabilitation residency program directors recognize these dimensions create more struggle to teach and evaluate⁽¹⁵⁴⁾.

Some years after the acknowledgement of these gaps - specifically in the case of systems-based practice - it still remains a shared notion among psychiatrists' residents that these important issues are still not sufficiently or effectively addressed in physical medicine and rehabilitation residency training⁽¹⁵⁵⁾. In the more recent years, these domains were

becoming targets for training, reflected in assessment and in the annual national self-examination for residents⁽¹⁵⁶⁾.

Below, we follow the same sub-headings of the 2nd review for core competencies in need for quality, supported by activities and research specifically addressing the education or training of rehabilitation providers.

5.1 Evidence-Based Practice (EBP)

In physical medicine and rehabilitation, the issue of applying an evidence-based practice, at least in the simplest direct way, is advocated as quite more challenging - and sometimes unable to be done - due the complex network of variables involved in the rehabilitation patient care. Therefore, it is defended an individualization of evidence-based knowledge to fit with patients' needs, for instance with the physiatrists performing the clinical reasoning role⁽¹⁵⁷⁾.

As highlighted by the rehabilitation 'black-box' phenomena, there is a lack of evidence-base for the evidence-based practice; therefore the education for evidence-based rehabilitation practitioners is affected by knowledge constrains.

In physiatrists' residency⁽¹⁵⁸⁾, reading habits are not much different from the practice physiatrists – both inferior of the academic physiatrists⁽¹⁵⁹⁾. It reinforces the idea of less interest for research evidence for practice and training, than for academics.

Among occupational therapy education, there is literature claiming for EBP-educational approaches that contemplates the context of a busy practice⁽¹⁶⁰⁾, and within multi-faceted continuous professional development activities⁽¹⁶¹⁾. Indeed, an educational initiative for practicing occupational therapists was able to markedly improve their EBP knowledge and skills. However it did not change the EBP behavior. The conclusion is that other behavioral determinants (e.g. attitudes towards EBP) also need to be addressed by training⁽¹⁶²⁾.

With an improved EBP practice, it is advocated that occupational therapy students would also benefit of having clinical teachers more able to do EBP, thereby promoting such student EBP development through modeling and experiential learning^(163; 164),

corroborating the notion that EBP-learning occurs mostly in practice situations supported by clinical teachers as for instance supported in the 2nd review.

Within physical therapy EBP-education, a systematic review reveals a growing yet modest number of published initiatives in EBP-training, as compared to occupational therapy ⁽¹⁶⁵⁾. Since there is already an instrument validated for assessing physical therapists' EBP knowledge and skills ⁽¹⁶⁶⁾, it is expected that these initiatives to be raised and more effectively measured. In addition, the systematic review results also suggest the use of active, multi-component knowledge-translation interventions to enhance knowledge and EBP behaviors as compared with passive dissemination strategies ⁽¹⁶⁵⁾, something also recognizable for the scope of general healthcare.

We should additionally note that Occupational Therapy (<http://www.otseeker.com/>) and Physiotherapy (<http://www.pedro.org.au/>) have web-based databases to ensure an accessible evidence-based (systematic reviews and clinical trials) information pertinent to their practice, which could be used by professionals and students, or ideally both at the same time. This is a kind of tool that can be fostered its use by EBP courses or training.

In summary, inter-professional EBP courses can be provided for allied healthcare and rehabilitation students with the ability to improve knowledge, skills, and confidence for EBP. However a course cannot change, at least if not addressing psychosocial constructs of behavioral change, the attitudes and behaviors towards EBP. In addition, there were no further assessments of such inter-professional EBP course on further EBP professional behaviors – a desirable outcome and a further research step to be taken ⁽¹⁶⁷⁾.

5.2 Patient-centered competencies

As supported in our 1st review and particularly 1st review – part B, the communication, interpersonal relationship and partnership competencies (the basis of patient-centered competencies) are scarcely touched in the specialty PAC Rehabilitation literature - at least specifically adapted to the rehabilitation unique scope. It happens also for the education of these competencies in rehabilitation students.

For instance, while in physiotherapists' curricula there could be often used modules for general healthcare communication training - and yet with an increasing focus on

experiential learning – it is still recognized a low base of empirical and specific applied communication knowledge to underpin the ideal state of education with such regards: something yet to be achieved⁽¹⁶⁸⁾.

In occupational therapy there is a strong professional theoretical focus on client-centered approaches, with roots in Canadian Model of Occupational Performance, thereby with educational focus on such intrinsic aspect of occupational therapy practice⁽¹⁶⁹⁾. The client-centered approach represents overarching professional principles, transversal to the wide range of occupational therapy. However, it does not reach interprofessional soundness and shared recognition among rehabilitation professionals. Moreover, it only recently received a measurement solution for educational initiatives⁽¹⁷⁰⁾, thus yet lacking solid empiric foundations as educational strategies targeting patient-centered care.

Perhaps the great exception on quantitative studies for rehabilitation professionals at this specific patient-centered and communication level would be the Sliwa and colleagues paper⁽¹⁷¹⁾. It outlines a specific physiatrists residents' training study addressing rehabilitation-specific communication skills. In the study, authors preliminarily shaped the specific and unique scope of communication with patients undergoing rehabilitation. As measured by an adapted questionnaire, the training was able to produce more patients' perceived improvement precisely on those items with more specific rehabilitation content. It calls for the need of specific rehabilitation approaches, instead of just providing general communication and patient-centered educational approaches.

Finally, patient-centered competencies could be also a target of the so-called interprofessional educational initiatives, particularly the emerging interprofessional training wards (IPWs - 2nd review). For instance, the patient-centered competencies could be learned in the IPWs through the use patients' narratives as a source of applied patient-centered education and training content⁽¹⁷²⁾.

5.3 Interdisciplinary teamwork competencies

The interprofessional education initiatives, mostly (IPTWs), could address teamwork education, and beyond, an inter-disciplinary teamwork education, particularly if using methods of structuring communication for interprofessional teamwork⁽¹⁷³⁾.

Indeed rehabilitation, being interdisciplinary in its essence, presents as one of the suitable healthcare fields for the application of IPTWs^(174; 175; 176; 177), being one of those which can most benefit of it in terms of interdisciplinary teamwork competencies⁽¹⁷⁸⁾. IPTWs in rehabilitation field shows it could remain a more cost-effective solution than traditional training wards⁽¹⁷⁷⁾. In addition, it represents an approach that generally receives enhanced appreciation from students^(175; 179), as well as from the patients being treated under the IPTWs in comparison with traditional wards⁽¹⁷⁹⁾.

As outlined in the 2nd review, there is a need for more solid research evidence, but the IPTWs baseline idea and preliminary available data sounds promising. It would make this training approach suitable for enhancing trainees' interdisciplinary teamwork competencies as applied to the rehabilitation field.

5.4 Quality and safety improvement education

Quality-improvement and safety-improvement competencies, which are acquired mostly through experiential learning (2nd review), seem to be barely touched by professional education of rehabilitation practitioners. For instance, physiotherapy clinical teachers in training wards rarely employ such kind of learning. Primarily it would relate with their own lack of quality-improvement competencies and habits, thus an inability to proportionate rehabilitation students with experiential learning about it⁽¹⁸⁰⁾.

Quality- and safety-improvement education could consist on initiatives based on team-project model, where trainees have a team-responsibility (ideally interdisciplinary) with the senior practitioners to entirely develop and deploy and improvement initiatives, supported by in-time seminars and coaching^(181; 182; 183).

The optimal places for such type multi-target quality, safety and improvement educational activities take place would be the clinical education rounds and residency programs. These are the places where these initiatives can be made more closely to the practice requirements, as simultaneously fulfilling senior practitioners' quality-improvement goals; while at the same time accomplishing trainees' educational goals for safety- and quality-improvement^(184; 185; 186).

In summary, as highlighted in the 2nd review; the development of quality- and safety-improvement competencies would benefit of being made at the same time by practitioners and students under the same improvement project in practice, accomplishing practice, continuing education and professional educational goals within the same quality- and safety-improvement regards.

C) MACRO-SYSTEM LEVEL

In the 2nd review, we developed a perspective of the new re-designing features undergoing in the US reforms for general health/healthcare delivering. Structural changes in the way general healthcare delivering is reimbursed, planned, designed, organized, and delivered will have natural consequences in the way Post-Acute (PAC) Rehabilitation will be also reimbursed, planned, designed, organized and also delivered.

Therefore, at this macro-system level, we had a different synthesis organization. We begin to overview the major features for same level presented at the 2nd review, progressively exposing the implications for the PAC Rehabilitation specific context, literature services and care. Thereafter, we briefly outline the actual organization of the US PAC Rehabilitation services (including the weaknesses), then exploring proposed possibilities for the re-organization of US PAC Rehabilitation services.

1) Organizational Role for Quality: Implications for PAC Rehabilitation

PAC Rehabilitation teams, units, or services are often part of a larger healthcare organizations such a hospital, a group of facilities, or a network of providers like an integrated delivery system of a unique or shared ownership; or alternatively constituting them-selves an healthcare organization, such as some free-standing settings.

1.1 Overview of the healthcare organizations role for quality (2nd review based)

Healthcare organizations, of any type, should develop and implement their own internal quality-assurance programs: fostered by accreditation entities; informed by external quality-monitoring; and stimulated by external policies such quality-aligned reimbursement, and public-reporting of quality-information.

Obviously, the mainstream of healthcare organizations will only pursue their internal quality programs or journeys – at least with an optimized and long-term commitment - if external stimulus are well-aligned, resulting in an unequivocal positive business-case for investing resources and attention on internal quality-journeys. Thus, we can easily get a perspective of the critical importance of achieving optimal alignment of incentives from external-level stakeholders - as well as engaging consumers' active role for quality - before developing organizational interventions if the aim is to produce a health/healthcare system results ^(187; 188).

Assuming it is achieved the idealized external level scenario for quality, turning the business-case unequivocally positive (yet far from being achieved for the US, as highlighted in the 2nd review); all healthcare organizations will want to pursue their own optimal organizational quality-journey: working on the structural conditions supporting quality-improvement can optimally occur.

These structural conditions were highlighted in-depth in the 2nd review. Herein, we just recall it includes: an organizational culture and committed leadership for quality and quality-investments; quality-aligned human resources and rewarding policies; the own organizational structure design and levels accountability for quality (e.g. service-lines organization with micro- and meso-systems levels of accountability); internal performance information systems; as finally the quality-improvement decision-making process (e.g. top-down or bottom-up approaches).

A congruent management of such organizational attributes - shaped by macro-organizational strategy, organizational quality-strategy, and available resources - sets the tone for the way quality-improvement initiatives will be developed within a healthcare organization, resulting in the best achievable organizational contribute to the quality of care consumers receive: a quality-supportive macro-system ^(189; 190).

1.2 Re-design organizational structure for quality: applied advantages for PAC Rehabilitation

Overviewed features represent the supportive organizational role for quality and quality-initiatives. Those are macro-system properties for quality irrespective of healthcare settings, thus also considered herein, applied to the of PAC Rehabilitation services. However, one of the mentioned features can be particularly advantageous for the PAC Rehabilitation services. That relates with re-designing organizational structure and the empowerment of accountability for quality and quality-improvement given to the levels of micro- and meso-systems of care - more close to the 'ground-level' of care delivered.

1.2.1 Micro-systems & PAC Rehabilitation

As outlined in the 2nd review, it is emerging a structural organizational (re-)design tending to attribute more accountability for performance/development of specific quality-improvement initiatives to the levels more close to the front-line: primarily through performance/quality-accountable clinical micro-systems structures; and in a second time/degree, for meso-systems structures accountable for service-lines that cut across micro-systems of care within and across organizational borders.

Indeed, in the perspective of clinical micro-system as the building blocks for quality-improvement initiatives ⁽¹⁹¹⁾, the micro-system should be responsible and accountable to the tasks of plan, design, implement and evaluate their services, care and specific quality-improvement initiatives: it happens despite quality-improvement initiatives that are infrastructural and/or transversal to all organization, or even technically supported for instance QI-departments, or information technology departments.

With planning and designing focus on clinical micro-systems, those quality-improvement initiatives would be responsive to contextualized field-knowledge the front-line practitioners hold. This is for instance related with the specific needs and preferences of their target population, local applied circumstances, the intricacies of the micro-system attributes, surrounding external relations, and finally the specificity, complexity and individualized scope of care in a particular healthcare area ⁽¹⁹¹⁾.

As supported in our 1st review, PAC Rehabilitation care as a quite distinct scope comparing with other healthcare areas: in terms of their paradigm, classification, multi-dimensionality of outcomes determinants (biopsychosocial rather than simply biomedical); resulting in an highly variable, complex, inter-disciplinary and individualized process scope, yet undetermined by the lack of knowledge of this active ingredients - as highlighted by the so-called 'rehabilitation black box' ⁽⁶⁸⁾. Therefore, the advantages of an organizational structure with performance/quality-improvement accountability on micro-systems can be particularly suitable in this specialty, as it becomes emerging in PAC Rehabilitation literature^(56; 90).

Picking the example of the applied PAC Rehabilitation 'quality paradox' (Background), it highlights the non-effectiveness and unintended effects of organizational quality-improvement programs applied to PAC Rehabilitation services ⁽⁵⁴⁾. An underlying reasons behind such applied 'quality paradox' relates with quality-improvement programs - top-down imposed – being quality/safety improvement initiatives of general scope narrowly applied in the PAC Rehabilitation field, without taking account the specific rehabilitation (micro-system) improvement needs and perspectives.

Such top-down and typically general hospital-based quality-improvement initiatives, non-specific or non-tailored to PAC Rehabilitation, are devalued by who shall apply them into routine practice: the PAC Rehabilitation front-line practitioners ⁽⁵⁴⁾.

In synthesis, the re-design of an organizational structure focused in micro-systems as accountable building blocks for performance and quality-improvement can make sense in the case of PAC Rehabilitation: transforming the naturally formed interdisciplinary rehabilitation teams into micro-systems that represent an organizational structure accountable their own, and specifically-framed, performance/quality-improvement.

1.2.2 Micro- and Meso-systems & PAC Rehabilitation

Clinical micro-systems represent the smallest unit of healthcare delivering and the building blocks for quality-initatives. However patients - mostly grouped into (sub-)populations with similar needs - often require a set or sequence of services from more than a clinical micro-system. Therefore, it has been emerging the need for planning and designing

‘service-lines’ that integrate a set of inter-linked micro-systems: those that respond to contingent and sequential needs of a determined (sub-)population. The organizational structure that leads, accounts for and coordinates such ‘service-lines’ are called as meso-systems.

Such emerging meso-system structures (for instance represented by a specified leader/coordinator) are accountable for the planning and performance/quality-improvement in its respective ‘service-line’. The meso-system leader uses their accountability to directly reporting to the senior management structure ⁽¹⁹²⁾.

But the meso-systems accountability does not mitigate the micro-systems accountability. Micro-systems (through its leadership) remain fully accountable for the performance and quality-improvement of their own building block. What happens differently for the micro-system elements and leadership is that despite reaming accountable for own performance/quality-improvement, each micro-system structure needs to contribute to ‘service-lines’ performance/quality-improvement, as managed and coordinated by the respective meso-system structure ^(65; 193; 194).

Such second level of micro-systems contribution and accountability (for the service-lines they make part of) is in practice a multi-level contribution since a same micro-system structure can make part - and contribute to the planning performance/quality-improvement - of several different service-lines as planned and managed by meso-systems structures within a overhead organization. The meso-systems leadership shall foster the needed collaboration among constitutive micro-systems building blocks.

Being a recently emerging theme in healthcare ⁽¹⁹²⁾, we do not have too many examples available in the literature for the development and implementation of meso-system structures accountable for service-lines, and even less involving PAC Rehabilitation service. But PAC Rehabilitation is inherently a part of a ‘service-line’ for acute episodes of care requiring post-acute care and rehabilitation, then long-term or follow-up care.

Indeed, post-acute care (PAC) means exactly a type of care that comes after acute-care needs and before the need for long-term, outpatient, follow-up care, or community care. Therefore PAC Rehabilitation inherently embedded in the middle of a ‘service-line’ for patients after ‘acute-episodes of care’ ^(10; 61).

The advancement that has been made for introducing bundled payments for acute-episodes of care (above exposed in payers section) can be an important external level input for organizations to formally establish accountable meso-systems' structures: developed from previous micro-systems structures as organizational building blocks.

In one of the few papers that illustrate the application of meso-systems as accountable organizational structures ⁽⁶⁵⁾, the exemplified case includes the cardiac rehabilitation micro-system services (a type of a PAC Rehabilitation service) within a 'service-line', managed by a formally established and emerging meso-system structure, that covered a sequence of inpatient/outpatient patients needs after a percutaneous cardiac intervention.

The examples available are yet just scarce, but the approach seems promising in the way that it addresses the major quality gaps of efficiency and coordination among the multiple services, enhancing a patient-centric quality for episode of case within delimited sub-populations. It matches with a major in-development payment trends that precisely aim to close those mentioned quality gaps ⁽⁶¹⁾, and it traduces care integration into a redesigned organizational architecture - accountable for performance/quality-improvement along the care continuum.

2) Redesigning Services Across Organizational Borders: Implications for PAC Rehabilitation

We were referring to the formation of service-lines composed by different micro-systems within the scope of a single healthcare organization. However, as optimally defined, those service-lines - and the meso-systems structures accountable for them – can be framed beyond macro-system organizational borders. It happens mostly for the US, in which healthcare is provided by multiple organizations of different ownership.

2.1 Service-lines/Meso-systems that cut across organizations

There are healthcare organizations that own or manage an integrated delivery system constituted by all micro-systems needed to produce a clinical service-line for a certain sub-

population. In that case, a clinical service-line can be exclusively covered within the borders of a same healthcare organization and their owned macro-system management structure. Although there are good examples of it ^(190; 191; 195), it is far from being the mainstream in the US.

For several other cases, there are small or more focused healthcare organizations that do not manage all the micro-system structures needed to establish a clinical service-line and a respective meso-system structure for a continuum of sub-population needs. It requires coming out of the exiting healthcare organizational borders, as well as having some entity leading, coordinating or at least activating such macro-collaborative and integrative process across organizations: a ‘macro-integrator’ below overviewed.

2.2 Inter-organizational service-lines promoted by a ‘macro-integrator’

The establishment of inter-organizational service-lines and respective meso-system structures - cutting across organizational borders - can be facilitated by an overarching structure called as the ‘macro-integrator’ ⁽¹⁸⁸⁾: a fundamental concept for the US healthcare delivering reform we previously highlighted in the 2nd review.

Recalling, the concept of the ‘macro-integrator’ does not refer to any type existent entity in specific; rather it refers to an overarching macro-structure which is accountable for quality and efficiency of care delivered to sub-populations within the limits of a specific community, local or region. Such organization shall have strong values centered on healthcare quality promotion, yet enough local influence to perform the overarching, activation and aggregative role of a ‘macro-integrator’.

The role of the ‘macro-integrator’ - as supported and legitimated by an aligned external payment policy - will be on planning for the whole services needed for a delimited sub-population (common characteristics) within a covered geography. Such entity would be accountable for allocating resources, thereby distributing the focus and investment for the most timely and cost-effective services or operations (e.g. primary care instead of high-technology acute care for the same sub-population need), but also by coordinating the intersections among healthcare organizations, in order to organize the continuum of care for sub-populations.

By the highlighted reasons, such ‘macro-integrator’ will be in optimal position to support the establishment of clinical inter-organizational service-lines, and respective meso-systems structures, contributing for the optimal healthcare regional system performance, quality and efficiency.

2.3 Macro-integrator role for integrating local community sectors/services: Implications for PAC Rehabilitation

To achieve their overarching quality and efficiency purposes, at a regional level, the action of macro-integrators should go far beyond the clinical emphasis we have been attributing to service-lines and respective meso-systems structures. They should additionally integrate the action of stakeholders of all other health-related community sectors, forming extended service-lines, including clinical service-lines and other services and resources available at the community level.

For instance, before a patient could need services from a clinical service-line (e.g. for an acute episode of care) the ‘macro-integrator’ shall be working collaboratively with non-healthcare stakeholders’ sectors and services: such as public health and health promotion entities, as well as police-makers. ‘Macro-integrators’ should use a systems thinking rationale to plan for integrated programs, projects and services that will be able to diminish the incidence of acute care cases: originating better community health with less healthcare expenditures^(188; 196; 197).

Following the clinical services-lines (e.g. for acute episodes), the ‘macro-integrator’ should also promote the optimal planed options for community integration and support after discharge from clinical service-lines: in order to promote long-term outcomes such function, participation, health-related quality-of-life (macro/ultimate-outcomes of our 1st review) - a matter of particular interest for PAC Rehabilitation as we below present.

2.3.1 Linking rehabilitation services to community sectors/services

More directly related with a rehabilitation paradigm, and mostly a community-based rehabilitation paradigm⁽¹⁹⁸⁾, the activity of the ‘macro-integrator’ following clinical acute

service-lines shall also be directed to plan and articulate with a large range of other community sectors and services to increase the complex overall quality of care persons with disability receive from health/healthcare system ⁽¹⁷⁾; as well as to prevent long-term disability ^(199; 200).

The goal is to enhance immediate function, but also community participation, employment and quality of life as long-term targets of rehabilitation. Such macro/delayed outcomes perspective is supported in our 1st review, being one of the pillars guiding the action of US National Institutes on Disability and Rehabilitation Research (NIDRR): the major PAC Rehabilitation research funder entity in the US ⁽²⁰¹⁾.

If we consider that ‘macro-integrators’ will be benchmarking and competing with other from other communities - on basis of whole system overarching measures ⁽²⁰²⁾, regarding quality, efficiency and value-based competition ⁽⁸⁹⁾- the PAC Rehabilitation providers would be stimulated by those ‘macro-integrators’ to actively collaborate with available local community services in planning and making arrangements for typical community-supportive needs after PAC Rehabilitation discharge ^(203; 204; 205).

As promoted and supported by the ‘macro-integrator’ role - accountable for system-level health results - such extended PAC Rehabilitation planning embracing after-discharge solutions shall systematically promote long-term community-related outcomes such participation or quality of life ⁽¹¹⁾. It represents an expansion of the PAC Rehabilitation planning for out of the PAC Rehabilitation clinical scope: in concrete to the community levels and services that represent the place (or supportive means) for community long-term outcomes to happen or being achieved. This is an operational way of intervening, by planning, in the ICF environmental outcomes ^(144; 145).

2.4 ‘Micro-integrator’: integrating care at a patient level, including PAC Rehabilitation

So far, we have been focusing attention at highlighting inter-organizational arrangements for clinical service-lines and well-planned integrated services that go beyond the specific scope clinical services: encompassing system arrangements with community sectors and services, by planning services to community sub-populations.

But in complement to planning services/service-lines to a sub-population within a delimited geography; there is also a need to coordinate care at an individual patient level, facilitating patient individual navigation into an actual fragmented US healthcare system⁽²⁰⁶⁾. This is a role attributed to a ‘micro-integrator’⁽¹⁸⁸⁾, for instance fitting with the principles of a Patient-Centered Medical Home (PCMH)⁽²⁰⁷⁾.

The PAC Rehabilitation services should communicate with the patient’s PCMH (the contrary could be also needed) as with any other service treating that patient. But particularly after an acute episode of care, the PAC Rehabilitation services could provide important information, guidance or advice for possible or desirable medium/long-term paths to follow within each particular patient situation. Such approach could be framed within a comprehensive yet brief discharge plan covering the patients and caregivers remaining difficulties and fragilities^(204; 205; 208), as well as supporting navigation and transition options^(11; 203), but in this case using the PCMH as a critical ally in the process, facilitating the implementation and mostly the long-term monitoring of what is recommended after PAC Rehabilitation discharge.

This is something that could be easily non-complied with a lack of adequate communication/coordinated processes among acute and primary care services, putting quality safety and continuity of patient care at risk^(204; 209).

3) Solutions for Reorganizing the US PAC Rehabilitation Services

At this point, we focus on possible pathways or solutions in a needed reorganization of the US PAC Rehabilitation services, made around quality and efficiency perspective for the whole healthcare system.

Like happening for general healthcare delivering, fragmentation of services and care is a major deficit also in PAC Rehabilitation. Current post-acute care in the US is recognizably chaotic, confusing, costly and less than clinically optimal^(8; 210).

As we begin to expose in Background; a major underlying cause of fragmentation is about PAC Rehabilitation appearing disaggregated by PAC-services type (LTCHs; IRFs; SNFs; HHAs). These services types, or settings, have their own regulation, claims requirements,

payment models, and quality-monitoring systems based on different and incompatible sets of performance/quality-assessment measures ^(8; 62).

The fragmentation of PAC Rehabilitation services not only limits the ability to compare pathways for sub-populations being served by those different settings, as it also may imply several admissions and discharges for other settings in other organizations. It hinders the longitudinal coordination of PAC Rehabilitation care, including optimal transitions along episodes. In summary, such system represents a provider-based model instead of patient-centric organizational model, thus it needs to be changed ⁽⁸⁾.

Major integrative changes in the way PAC services are organized will come in the following years embedded within an ongoing general healthcare delivering reform - attached to the mainstream introduction of the already mentioned CARE tool, uniformly applied to PAC settings. After revealed the data of actually undergoing demonstration with the CARE tool, (PAC- PRD) Post Acute Care Payment Reform Demonstration project (<http://www.pacdemo.rti.org/>), some political definitions will become to appear in terms of completely redefine the way PAC Rehabilitation care will be planned, designed and managed at a macro-system level. Until there, possible solutions for reorganization of PAC Rehabilitation are being proposed.

Below we describe a proposal recently released by the American Medical Rehabilitation Providers Association for the claimed re-organization, with their inherent potential advantages and limitations. Additionally, we should also taking account it comes from a representative of a directly interested part in the results of such needed re-organization, with potential conflicts of interest.

1.1 Creating a Continuing Care Hospital structure: concept and (dis)advantages

The Continuing Care Hospital (CCH) would be an amalgam of the hospital-based PAC settings currently described as: Long-Term Care Hospitals (LTCHs), Inpatient Rehabilitation Facilities (IRFs), and Hospital-based Skilling Nursing Facilities (HSNFs) that are organized, at least in part, to deliver rehabilitation therapy programs. As proposed, The CCH would also provide or coordinate home health and outpatient rehabilitation services for patients who need them after discharge ⁽⁵⁰⁾.

The CCH could be an actual building (a hospital offering some or all three levels of care) or a virtual entity (an organization that provides three levels of PAC Rehabilitation in more than one building or unit, but under a same management structure). The CCH would account for the intensity of services provided, patient complexity and need for care by physicians and nurses and other professionals and services. The facility would admit the patient, and the clinical staff would place the patient in the appropriate specific unit or building (which might resemble today's LTCH), and move the patient from setting (what today looks like an IRH/U) to setting (what today looks like an HSNF) as clinical needs dictated - all within a single payment. This is similar in principle to how an acute hospital admits a patient to the ER; transfers them to an ICU; moves them to an OR; cares for them in a recovery room; transfers back to an ICU; then to a ward, and finally to discharge.

Creating and using performance and quality measures would be a key and critical component of this model. As the ICD-10 coding system becomes adopted, the parallel adoption of the World Health Organization's International Classification of Function (ICF) should also be pursued. Use of performance measures would allow development of payment methods rewarding institutions that constantly achieve better risk-adjusted medical and functional outcomes, probably requiring longer lengths of stay.

Within the concept paper, it is additionally proposed that the payment system provide a good weight on bonuses for outcomes (in a state of maturation); as well as providers would only be allowed to care for certain types of patients if they demonstrated the ability to provide care, as defined by law and regulation, met specific program standards of care, and demonstrated a minimum level outcomes.

1.1.1 Disadvantages of the proposed CCH

Among major disadvantages of CCH model - at least in the way conceptually proposed - we might mention it only accounts for PAC and subsequent care, not including the acute-care. If not added complementary incentives, the CCH or other entity receiving the bundle (controlling the payment) would have inherent incentives to manage the money, using the owned available facilities, putting access in jeopardy, and promoting competition among subsequent facilities (e.g. SNF; HHA and outpatient providers) on the basis of price rather than service quality or value.

Finally, an important limitation is that consumers might not have the possibility to choose one provider and then a different provider for a subsequent level. That is the opposite of the consumer-centered quality, advocated for healthcare and for the PAC Rehabilitation ⁽²¹¹⁾. This is because it eliminates the critical role of quality-informed choice for providers ⁽²¹²⁾, as we begin to outline in consumers section.

D) MICRO-SYSTEM LEVEL

We now embrace the features for quality and quality-initiatives in PAC Rehabilitation micro-system services and care, following an equivalent structure of the 2nd review.

1) Coordination within PAC Rehabilitation Micro-systems

PAC Rehabilitation services and care can be pro-actively planned for sub-populations (mostly based on feed-back data); coordinated in care for each patient (based on feed-forward registries and easy access to information); and by improving the team-process (team operational proceeding and underlying relationships).

1.1.1 Planning PAC Rehabilitation micro-system services and care

As supported in the 2nd review, the first way of improving care coordination is by proactively planning and designing micro-system services, care and workflow. Such planning would be made at least for most prevalent situations and conditions, yet opening space for individualized clinical care.

Planning micro-systems services and workflow for higher coordination, efficiency and quality of services and care shall be underpinned by frontline-based solutions, but also with a solid basis of information or data about services, characteristics of sub-populations

attended, demand variations, as well as patients' and families' needs, perceptions, values and preferences for services and care.

As outlined in the 2nd review, planning an internal information and data-collection system - added to externally-required information and monitoring system - would furnish critical feedback on clinical and management data for further PAC Rehabilitation services planning.

A critical step for the rehabilitation process and care-planning is the collaborative, patient-centered, and interdisciplinary goal-setting process^(31; 213; 214; 215; 216) – which among other things would represent a first step for enhancing care coordination within micro-system^(217; 218), ideally using a common classification/language such the ICF⁽²¹⁹⁾.

Indeed, it is recognizable that team care goals is a first step for an effective coordination along the rehabilitation process, however there is greater difficulty in define exactly how to make it⁽²²⁰⁾, with areas of consensus and controversies⁽²¹⁶⁾. Exactly how to make such process should become *a priori* defined by each PAC Rehabilitation micro-system: although research evidence does not bring yet conclusive answers for the whole of this process^(216; 220).

For instance, in a very recent systematic review, collaborative and patient-centered goal-setting/planning practice appears with low prevalence in practice, also due a series of practical and systemic constrains: one of the barriers is exactly not having solid evidence of the impact for care and outcomes of patient-centered goal-setting processes⁽²²¹⁾, other barrier is the fact of healthcare system policies are not aligned with such principles, which bring clinicians to a difficult task of balancing patient-centered care decisions and meet perceived professional responsibilities that might act against⁽²²²⁾.

Predicting the type and grade of macro functional-outcomes achievable after rehabilitation is also another complex task that varies according to a great number of factors, but it shall remain a task for both - the rehabilitation professionals and the patient/family to a achieve in an active partnership reflected along care^(28; 223). For instance, while professionals bring a technical background for the goal setting and care planning process: according to an assessment of a rehabilitation potential⁽²²⁴⁾; patients and families need to bring value and meaningfulness for directing rehabilitation goals matching with person's life goals^(32; 225). Such collaborative process should start with exploration of patients' life story, self-reported

needs, existential struggle and the level of expectations and information needs at the rehabilitation unit arrival ^(226; 227; 228). This is specifically developed and supported in the 1st review –part B.

Finally, goal-setting and care planning should focus and serve as a guide for the entire PAC Rehabilitation care, facilitating seamless transitions of goals and coordinated care across PAC settings in a patient-centered, longitudinal, quality perspective ^(64; 62).

1.1.2 Sharing clinically-relevant information: The need for interdisciplinary uniform recording/registry-system

Sharing or exchanging relevant information within micro-system's personnel is a critical feature for coordinating patient care and overall team-performance in any healthcare area ⁽²²⁹⁾. For instance, in emergency care, there is urgency for readily available and right-on-time information. But in PAC Rehabilitation, sharing of relevant information - although without the same time-urgency - is also a requirement for complex care coordination among multi-disciplinary professionals. For instance, it is denoted that timely provision of information about processes and outcomes to the whole rehabilitation staff was associated with improved stroke outcomes ⁽²³⁰⁾.

As exposed in the 2nd review, a requirement for effective information-sharing is the development and use of a common registering/recording system (process and content), tailored to the service demands and workflow. Also in the PAC Rehabilitation literature, it is recommended the use of a superordinate shared communication/mental model, facilitating mutual-adjustments among professionals and coordination of care ^(231; 232).

Indeed, the existence of multi-disciplinary professionals, of different backgrounds, philosophies, and using their own professional frameworks, classifications and taxonomies can be an important obstacle to the share of relevant information in PAC Rehabilitation. Even among the same rehabilitation disciplines, treating the same conditions in different places, there is a lot of variation in the type of interventions, nomenclature and language used ⁽⁹⁴⁾. Therefore a uniform and interdisciplinary framework, classification and taxonomy for process/interventions would have the benefit of putting professionals of different disciplines talking, reasoning and registering on a common language. It could additionally

clarify specific and complementary roles for the care-process, as happened also with the ICF framework/classification⁽²³³⁾.

Common intervention-taxonomies (for the purposes of practice-based outcomes research) were recently developed in the PAC Rehabilitation field: for stroke^(68; 85; 132) and spinal-cord injury rehabilitation^(84; 94; 112). Yet those intervention-taxonomies are condition-specific and it still does not exist a common, overarching, non-condition-specific classification for the PAC Rehabilitation overall interventions, as happening for the functional outcomes framed by the ICF - a non-condition-specific framework and classification holding training/implementation benefits⁽¹⁴⁶⁾.

In synthesis, a micro-system structure can benefit of holding a uniform interdisciplinary recording/registering system for clinical-data and care-process/interventions - beyond administrative, claims and other type of data yet externally-required. Moreover, if such uniform recording/registering process was made electronically at the point-of-care (POC)⁽¹⁴⁶⁾, it could have also the benefit of furnishing important data for real-time and feed-forward care coordination, shared and readily accessible by all interdisciplinary practitioners on portable devices; as broadly it collects critical information for further feedback analyses and practice-based research purposes^(84; 112).

However, we shall denote that such uniform recording/registering system (electronic or not) needs to fit, and hopefully, benefit the workflow, instead of being another burdensome task for the busy practitioner, otherwise practitioners will easily, and perhaps rationally, mitigate such implementation efforts^(56; 234).

1.1.3 Improving the PAC Rehabilitation teamwork process

PAC Rehabilitation teamwork process has a central/pivotal role to PAC Rehabilitation care, outcomes and quality, as supported and illustrated in our 1st review. Indeed, the outcomes of a PAC Rehabilitation process are better seen as micro-system outcomes, beyond the sum of multidisciplinary results of individual practitioners/disciplines. Such micro-system outcomes also depends rehabilitation team synergic action, as well as depends of the administrative, ancillary and other staff contributes. It is suggested that the complementary roles and interdependency among practitioners of different disciplines should be actively

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fostered^(235; 236). For instance, nurses should reinforce the promotion of autonomy, mobility and other core intervention strategies, even if primarily trained for instance by therapists. In the opposite direction, therapists and all other practitioners should reinforce rehabilitation nursing primary activities, such bladder management and other interventions^(56; 234; 236). However, first of all, it is required an enhanced notion of belonging to a delimited micro-system among rehabilitation, as supported in the 2nd review.

PAC Rehabilitation is suitable for a micro-system approach. But despite being promoted an inter-disciplinary team-based approach, there is a paradox pervading rehabilitation since its inception, because for long time it was devoted little efforts towards examining and understanding what it means or how to improve it. Strasser and colleagues were the exceptions working systematically on the subject. Along their work, the teamwork process was found to be a determinant of functional outcomes, as showed in observational⁽²³⁷⁾, and team-training randomized controlled trial specifically in stroke-rehabilitation⁽²³⁸⁾.

In the 2nd review we sub-divided the task of improving the teamwork process in: improving the teamwork structure and operations, and improving the underlying team interpersonal relationships. It fits with the Strasser and Falconer's conceptual model highlighting teamwork inner-process components: a dynamic interaction between team-actions and team-relations^(239; 240). The teamwork leadership is critical for the teamwork patterns with formal and informal leadership representing a target for PAC Rehabilitation teamwork improvement interventions^(230; 241).

Complementing a micro-system 'opportunistic' information-sharing, dialogue, learning and reasoning⁽²⁴²⁾; also the structured SBAR approach - imported from aviation to healthcare areas - was also recently adapted to PAC Rehabilitation, particularly favoring an operational structure for formal communication and coordination^(243; 244).

2- Quality-Improvement (QI) within the PAC Rehabilitation Micro-System

The quality-improvement (QI) process within the PAC Rehabilitation micro-system is equivalent to general healthcare; thereby outlined in the 2nd review. But despite the process could follow general guidance, in PAC Rehabilitation there are content/dimensions of care

particularly suitable to produce transformational micro-system quality-improvement. For instance the teamwork and interpersonal dimensions of care, particularly approached together and with an interprofessional emphasis, as analyzed below.

Finally, there are also interprofessional educational initiatives, in case applied to quality-improvement learning ⁽²⁴⁵⁾, which fit within PAC Rehabilitation micro-systems. An educational focus could be combined with practice quality-improvement goals, in a same project, with mutual benefits for practice and education since quality-improvement competencies are educated/improved in real-practice projects at the micro-system level ⁽¹⁸⁵⁾.

2.1 Transformational improvement in PAC Rehabilitation micro-systems

Our conceptual model (1st review) divides the process axis in three dimensions: the technical dimension, the interpersonal dimension and the underlying team-work process. While the technical dimension has been receiving attention, the other two dimensions have receiving much less research, education and improvement attention.

2.1.1 Interpersonal and teamwork: dimensions supporting long-term transformational improvements

Only in the last decade the teamwork process received some systematic input from Strasser and colleagues work. The interpersonal dimension was not systematically addressed, despite few isolated exceptions ^(171; 246). The interpersonal dimension of care is one that has recognizably lower baseline expertise among practitioners ^(247; 248); while the teamwork process and coordination of care is a major area for healthcare transformational quality-improvement in healthcare ⁽¹⁸⁷⁾, also with lower basis of formal training in PAC Rehabilitation, yet with preliminary promising findings ⁽²⁴⁹⁾.

Therefore, it is reasonably expectable that a systems-based improvement in the interpersonal and teamwork processes of care can support long-term transformational changes in PAC Rehabilitation quality and outcomes. Our conceptual framework outlines the teamwork and interpersonal dimensions both supporting the technical care, either by

fostering care coordination, as well as fostering team-patient/family partnerships and users psychosocial engagement outcomes – better supported in a further 1st review – part B.

2.1.2 Taking benefit of commonalities: improving and educating the teamwork and interpersonal dimension together in interprofessional initiatives

As highlighted in the conceptual framework, there are also commonalities among the teamwork and interpersonal dimension. First, the quality of the interpersonal dimension has also a coordination of care component as outlined in the 1st review. Second, the 1st review also outlines teamwork and interpersonal dimension as being both supported in a common set of underlying interpersonal, communication and relational skills and competences (structure), yet applied to different tasks: one to the interprofessional communication and relations; the other to providers-patient-family communication and relations. We recall these competences correspond to competencies supported in the 2nd review as in need for micro-system workforce development.

Due commonalities and lower baseline competencies at these levels, an improvement intervention simultaneously targeting these two dimensions and underlying common determinants might be optimally for improving micro-system performance.

As outlined in the 2nd review, there are also multiple benefits of linking quality-improvement with continuous professional development, as well as with healthcare students' education. With such regards, we could recall that multi-target interventions on different but complementary dimensions of care - such these teamwork and interpersonal dimensions - have successful interprofessional approaches in the healthcare education field. This is the case of inter-professional training wards (IPTWs) initiatives, particularly suitable for the PAC Rehabilitation interdisciplinary care^(250; 251).

E) PUBLIC POLICY-MAKERS LEVEL

Under this heading, we first highlight the seminal influence of PAC political input⁽⁸⁾, and overviewing subsequent system changes occurring in the US PAC Rehabilitation system:

outlined along the review. Such political input also serves as an illustrative example of the overarching influential role the public policy can achieve to fundamentally transform the quality of PAC Rehabilitation care. Then, using an equivalent structure of the 2nd review, we outline how PAC Rehabilitation Public Policy roles for quality have been applied in the US context.

1) A PAC Rehabilitation Policy Reform for Quality

As directly or indirectly outlined along thesis, there was a major political input for actual and further reforms in US PAC services in sequence of the 2005 Deficit Reduction Act: a Post-Acute Care Reform Plan ⁽⁸⁾. After an overview of the current problems in the PAC System, such policy paper outlines the principles of the reform, with a central focus on a patient-centered perspective for quality of care (as we begin to outline in the consumers section), with patients and families central in definition and control of services. Thus, PAC Rehabilitation services should become organized around a continuum of users needs, with enhanced coordination of care and seamless transitions across settings: the contrary of what is actually happening in the US ⁽⁵⁹⁾.

Other important principles of the reform are the focus on providing high-quality and efficient care, fostered by the development of a performance/quality measurement system measuring patient's progress across settings – on a pre-determined time-schedule irrespectively of the PAC settings assuring treatments. That was the seminal input for the development of the CARE tool, so-mentioned along thesis, actually in later stages of the demonstration project (www.pacdemo.rti.org/). Finally such PAC Rehabilitation performance/quality measurement system should be built into the functionality of an interoperable developed, and widely deployed, Electronic Health Records (EHR) for coordination of care and easier quality-data management ⁽²⁵²⁾.

The mentioned enhanced roles of quality-monitoring led to other critical feature of the reform, which is the intention to reflect performance in quality-measures (outcomes and process measures) into PAC payments: a pay-for-performance perspective ⁽⁸⁾. With such regards the ultimate goal is to come into a direction of a site-neutral payment schema for PAC services, stimulating accountability for quality and efficient along PAC episodes.

More recently, under the general US healthcare reform, it seems the PAC payment will be bundled with acute care, and possibly also involving subsequent care within a determined period of time⁽¹⁴⁾, as outlined in the Payers & Purchasers section.

2) US Public Policy Roles for PAC Rehabilitation Quality

The public policy has a critical overarching influential role for quality and quality-initiatives in general healthcare (2nd review), and also in PAC Rehabilitation.

2.1 Healthcare Delivering Role

The US federal government, among other things, is an active player - mostly through the Veterans' Health Administration (VHA) - in the aspect of healthcare delivering, also providing PAC Rehabilitation care. Therefore, as suggested and supported in the 2nd review, the federal healthcare delivering role, and its developed and adopted solutions, can lead other providers to delivering quality of care, by example. Some VHA leading examples are yet on the field also the PAC Rehabilitation scope^(90; 252).

2.2 Funder of health-services and quality-related research

Other way the federal policy has to influence the country's quality of care is by funding health services, outcomes, comparative effectiveness and quality-related research (measurement, reporting, improvement, implementation, and quality-aligned reimbursement and accountability systems) that would better inform policy, services and care management on evidence-base for quality and efficiency⁽²⁵³⁾.

In the US, there was recently launched a Patient-Centered Research Outcomes Institute (PCROI), by the famous PPAC act⁽¹⁴⁾. The PCROI will begin to play a critical role with public funding regards, particularly funding a comparative effectiveness research agenda. The actual US governmental funding for health-services, outcomes and quality-related

research is made mostly through the governmental Agency for Healthcare Research and Quality (AHRQ).

The development of the Consumer Assessment of Healthcare Providers and Systems' (CAHPS) program (the major assessment of patient-centeredness for different healthcare areas) is one of the major initiatives sponsored by the AHRQ. It is in need for advances for the specificity of the PAC Rehabilitation scope as we began to outline in the consumers section. Indeed, there is at least a temporal gap in the action among different federally-sponsored players. Matching the action of different federal players and programs is a critical matter in a national journey for quality ⁽²⁵⁴⁾.

2.3 The largest payer and the regulatory roles

Another roles for public policy-makers (in case federal and state policy-makers) are built around the payer role (Medicare and Medicaid – covering majority of PAC Rehabilitation sub-populations), as well as around the regulatory role. In this review we approach these two roles in a complementary way, as outlined for general healthcare ⁽²⁵⁴⁾, as it is also a matter under discussion for the PAC Rehabilitation field.

An illustrative example would be a recent insightful paper in which DeJong discusses the question of bundled payments for acute and post-acute ⁽⁴⁹⁾, a solution to be implemented in the field ⁽¹⁴⁾. The paper illustrates how inefficiencies of prevailing payment system led to an uncontrolled grow of regulatory action. Such a phenomenon had a great implication for shaping the business paradigm of PAC organizations, and thereby shaping efforts and concerns of the frontline practitioners.

DeJong ⁽⁴⁹⁾ highlights the practitioners' lack of satisfaction with their job, described as providing care for comply with regulation, not necessarily for improving value of care (quality and cost) for their patients and sub-populations attended - which often do not fit with regulation, mostly an over-regulation triggered by the lack of an effective value-based purchasing method. The major desirable consequence of an effective introduction of bundled payments is that it could fundamentally shift the actual need for over-regulation (which shapes an actual practice culture of regulation-compliance), becoming replaced by a culture of innovation and informed best-practices stimulated by a value-based purchasing

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method, thus reducing the need for compensatory regulation. Yet there are practical implementation features to overcome ⁽⁴⁹⁾.

In a final synthesis, as positioned at an overarching ecological level, the public policy stakeholders have - like no other stakeholder could achieve - the power and responsibility of tuning the “games rules” for quality: shaping, and providing example and stimulus for a culture of quality in healthcare organizations. Policy stimulus shall be reflected in organizational and practitioners’ action for quality and quality-improvement in the IOM’s six dimensions: effectiveness, efficiency; timeliness; safety; equity and patient-centeredness – with patient-centeredness at the center quality of definition and control for general healthcare ⁽³⁾, and particularly for PAC Rehabilitation ⁽⁸⁾.



References (3rd review)

1. **Berwick, D.** A user's manual for the IOM's 'Quality Chasm' report. Patients' experiences should be the fundamental source of the definition of quality. *Health Affairs*. 2002, Vol. 21 (3), pp. 80-90.
2. **Berwick, DM.** What 'patient-centered' should mean: confessions of an extremist. *Health Aff*. 2009, Vol. 28(4), pp. w555-65.
3. **US Department of Human and Health Services.** *National Health Care Quality Strategy and Plan*. 2010. Available from: www.hhs.gov/news/reports/quality/nationalhealthcarequalitystrategy.pdf.
4. **Epstein RM, Fiscella K, Lesser CS, Stange KC.** Why The Nation Needs A Policy Push On Patient-Centered Health Care. *Health Aff*. 2010, Vol. 29, pp. 1489-95.
5. **Kramer, A.** Rehabilitation care and outcomes from the patient's perspective. *Med Care*. 1997, Vol. 35, pp. JS48-JS57.
6. **Magasi S, Durkin E, Wolf MS, Deutsch A.** Rehabilitation consumer's use and understanding of quality information: A health literacy perspective. *Arch Phys Med Rehabil*. 2009, Vol. 90, pp. 206-12.
7. **Magasi S, Heinemann AW.** Integrating stakeholder perspectives in outcome measurement. *Neuropsychol Rehabil*. 2009, Vol. 21, pp. 1-13.
8. **US Policy Council.** Post-Acute Care Reform Plan. 2006, Available on www.cms.hhs.gov/SNFPSS/Downloads/pac_reform_plan_2006.pdf.
9. **Gage B, Morley M, Spain P, Ingher M.** *Examining Post Acute Care Relationships in an Integrated Hospital System*. Waltham, MA : RTI International, 2009. Available at: aspe.hhs.gov/health/reports/09/pacihs/report.pdf.
10. **Kane, RL.** Assessing the effectiveness of postacute care rehabilitation. *Arch Phys Med Rehabil*. 2007, Vol. 88(11), pp. 1500-4.
11. **Wissel J, Olver J, Sunnerhagen KS.** Navigating the Poststroke Continuum of Care. *J Stroke Cerebrovasc Dis*. 2011, Vol. Jul 4. [Epub ahead of print].
12. **Institute of Medicine.** *Performance Measurement: Accelerating Improvement*. Washington DC : National Academy Press, 2005.
13. **National Quality Forum.** *Measurement Framework: Evaluating efficiency across patient-focused episodes of care*. Washington. Available at: http://www.qualityforum.org/Publications/2010/01/Measurement_Framework__Evaluating_Efficiency_Across_Patient-Focused_Episodes_of_Care.aspx : NQF, 2010.
14. **US Federal Government.** *PPACA: Patient Protection and Affordable Care Act*. s.l. : US Government. Available at <http://democrats.senate.gov/reform/patient-protection-affordable-care-act-as-passed.pdf>, 2010.
15. **Iezzoni LI, Davis RB, Soukup J, O'Day B.** Satisfaction with quality and access to health care among people with disabling conditions. *Int J Qual Health Care*. 2002, Vol. 14(5), pp. 369-81.
16. **Iezzoni LI, Davis RB, Soukup J, O'Day B.** Quality dimensions that most concern people with physical and sensory disabilities. *Arch Intern Med*. 2003, Vol. 163(17), pp. 2085-92.
17. **Lawthers AG, Pransky GS, Peterson LE, Himmelstein JH.** Rethinking quality in the context of persons with disability. *Int J Qual Health Care*. 2003, Vol. 15(4), pp. 287-99.
18. **Cott CA, Wiles R, Devitt R.** Continuity, transition and participation: preparing clients for life in the community post-stroke. *Disabil Rehabil*. 2007, Vols. 15;29(20-21), pp. 1566-74.
19. **Turner BJ, Fleming JM, Ownsworth TL, Cornwell PL.** The transition from hospital to home for individuals with acquired brain injury: a literature review and research recommendations. *Disabil Rehabil*. 2008, Vol. 30(16), pp. 1153-76.
20. **Cott, CA.** Client-centred rehabilitation: client perspectives. *Disabil Rehabil*. 2004, Vol. 26(24), pp. 1411-22.
21. **Elwood D, Heckman J, Bonder J, Pantel A, Blatz D, Moroz A, Ben-Roohi M.** Assessing patient expectations and concerns in a physical medicine and rehabilitation unit: a real-time snapshot. *PM R*. 2010, Vol. 2(6), pp. 521-7.
22. **Brook RH, McGlynn EA, Schekelle PG.** Defining and measuring quality of care: a perspective from US researchers. *Int J Qual Health Care*. 2000, Vol. 12(4), pp. 281-95.

Results: 3rd review

23. **Bensing J, van Dulmen S, Tates K.** Communication in context: new directions in communication research. *Patient Educ Couns.* 2003, Vol. 50(1), pp. 27-32.
24. **Delvaux, N, e Razavi D, Marchal S, Brédart A, Farvacques C, Slachmuylder JL.** Effects of a 105 hours psychological training program on attitudes, communication skills and occupational stress in oncology: a randomized study. *Br J Canc.* 2004, Vol. 90, pp. 106-14.
25. **Fallowfield L, Lipkin M, Hall, A.** Teaching senior oncologists communication skills: results form phase I of a comprehensive longitudinal program in the United Kingdom. *J Clin Onc.* 1998, Vol. 16, pp. 1961-8.
26. **Parle M, Maguire P, Heaven C.** The development of a training model to improve health professionals' skills, self-efficacy and outcome expectancies when communicating with cancer patients. *Soc Sci Med.* 1997, Vol. 44 (2), pp. 231-40.
27. **de Haes H, Teunissen S.** Communication in palliative care: a review of recent literature. *Curr Opin Oncol.* 2005, Vol. 17(4), pp. 345-50.
28. **Pullenayegum, S,** Patient-professional partnership in spinal cord injury rehabilitation. *Br J Nurs.* 2004, Vol. 14 (14), pp. 778-84.
29. **Wiles R, Ashburn A, Payne S, Murphy C.** Discharge from physiotherapy following stroke: the management of disappointment. *Soc Sci Med.* 2004, Vol. 59(6), pp. 1263-73.
30. **Scobbie L, Wyke S, Dixon D.** Identifying and applying psychological theory to setting and achieving rehabilitation goals. *Clin Rehabil.* 2009, Vol. 23(4), pp. 321-33.
31. **Siegert RJ, Taylor WJ.** Theoretical aspects of goal-setting and motivation in rehabilitation. *Disabil Rehabil.* 2004, Vol. 26(1), pp. 1-8.
32. **Nair, K.** Life goals: the concept and its relevance to rehabilitation. *Clin Rehab.* 2003, Vol. 17, pp. 192-202.
33. **Doering BK, Conrad N, Rief W, Exner C.** Life goals after brain injury in the light of the dual process approach: empirical evidence and implications for neuropsychological rehabilitation. *Neuropsychol Rehabil.* 2011, Vol. 21(4), pp. 515-38.
34. **Visser-Meily A, Post M, Gorter JW, Berlekom SB, Van Den Bos T, Lindeman E.** Rehabilitation of stroke patients needs a family-centred approach. *Disabil Rehabil.* 2006, Vol. 28(24), pp. 1557-61.
35. **Bowen C, Yeates, Palmer S.** *A Relational Approach to Rehabilitation: Thinking about relationships after brain injury.* London : Karnac, 2010.
36. **Kendall E, Buys N.** An Integrated Model of Psychosocial Adjustment Following Acquired Disability. *The Journal of Rehabilitation.* 1998, Vol. 64.
37. **Livneh, H.** Psychosocial adaptation to chronic illness and disability: A conceptual framework. *Rehabil Counsell Bull.* 2001, Vol. 44:3, pp. 151-60.
38. **Nichols, K.** *Psychological Care for Ill and Injured People: a clinical guide.* Philadelphia : Open University Press, 2003.
39. **Oliveira, RA.** *[Clinical Psychology and Physical Rehabilitation].* Lisbon : ISPA, 2001.
40. **Kortte KB, Wegener ST.** Denial of illness in medical rehabilitation populations: theory, research, and definition. *Rehabil Psychol.* 2004, Vol. 49, pp. 187-99.
41. **Kortte KB, Falk LD, Castillo RC, Johnson-Greene D, Wegener ST.** The Hopkins Rehabilitation Engagement Rating Scale: Development and psychometric properties. *Arch Phys Med Rehabil.* 2007, Vol. 88, pp. 877-84.
42. **Medley AR, Powell T.** Motivational Interviewing to promote self-awareness and engagement in rehabilitation following acquired brain injury: A conceptual review. *Neuropsychol Rehabil.* 2010, Vol. 20(4), pp. 481-508.
43. **Hibbard JH, Mahoney E.** Toward a theory of patient and consumer activation. *Patient Educ Couns.* 2010, Vol. 78(3), pp. 377-81.
44. **Lenze EJ, Munin MC, Quear T, Dew MA, Rogers JC, Begley AE, Reynolds CF.** Significance of poor patient participation in physical and occupational therapy for functional outcome and length of stay. *Arch Phys Med Rehabil.* 2004, Vol. 85(10), pp. 1599-601.
45. **Hall AM, Ferreira PH, Maher CG, Latimer J, Ferreira ML.** The influence of the therapist-patient relationship on treatment outcome in physical rehabilitation: a systematic review. *Phys Ther.* 2010, Vol. 90(8), pp. 1099-110.

Results: 3rd review

46. **Silverstein B, Findley PA, Bode RK.** Usefulness of the nursing home quality measures and quality indicators for assessing skilled nursing facility rehabilitation outcomes. *Arch Phys Med Rehabil.* 2006, Vol. 87(8), pp. 1021-5.
47. **Hibbard JH, Harris-Kojetin L, Mullin P, Lubalin J, Garfinkel S.** Increasing the impact of health report cards by addressing consumers concerns. *Health Aff.* 2000, Vol. 19, pp. 138-43.
48. **Hibbard JH, Hewet JJ.** What type of quality information do consumers want in a health care report card? *Med Care Res Rev.* 1996, Vol. 53, pp. 28-47.
49. **DeJong, G.** Bundling acute and postacute payment: from a culture of compliance to a culture of innovation and best practice. *Phys Ther.* 2010, Vol. 90(5), pp. 658-62.
50. **American Medical Rehabilitation Providers Association.** *An option for the future of medical rehabilitation and other post acute care hospital providers: The Continuing Care Hospital.* s.l. : Available at: <http://www.amrpa.org/uploads/docuploads/CCH%20concepts%20paper.pdf>, 2009.
51. **Keith, R.** Patient satisfaction and rehabilitation services. *Arch Phys Med Rehabil.* 1998, Vol. 79, pp. 1122-8.
52. **Heinmann, A, et al.** Measuring Patient Satisfaction with Medical Rehabilitation. *J Rehabil Outcomes Meas.* 1, 1997, Vol. 4, pp. 52-65.
53. **Hall J, Dornan M.** What patients like about their medical care and how often they are asked: A meta-analyses of the satisfaction literature. *Soc Sci Med.* 27, 1988, pp. 935-9.
54. **Strasser, DC.** Challenges and opportunities for quality in Rehabilitation. in Flanagan SR, Zaretsky H, Moroz A (eds). *Medical Aspects of Disability: A handbook for the rehabilitation professional (4th edition).* NY : Springer, 2010.
55. **Magasi S, Heinemann AW.** Integrating stakeholder perspectives in outcome measurement. *Neuropsychol Rehabil.* 2009, Vol. 21, pp. 1-13.
56. **Strasser, DC.** Challenges and opportunities for quality in Rehabilitation. in Flanagan SR, Zaretsky H, Moroz A (eds). *Medical Aspects of Disability: A handbook for the rehabilitation professional (4th edition).* NY : Springer, 2010.
57. **Chan, L.** The state-of-the-science: challenges in designing postacute care payment policy. *Arch Phys Med Rehabil.* 2007, Vol. 88(11), pp. 1522-5.
58. **Kaplan, SJ.** Growth and payment adequacy of medicare postacute care rehabilitation. *Arch Phys Med Rehabil.* 2007, Vol. 88(11), pp. 1494-9.
59. **Gage B, Stineman M, Deutsch A, Mallinson T, Heinemann A, Bernard S, Constantine R.** Perspectives on the state-of-the-science in rehabilitation medicine and its implications for Medicare postacute care policies. *Arch Phys Med Rehabil.* 2007, Vol. 88(12), pp. 1737-9.
60. **Stineman MG, Tassoni CJ, Escarce JJ, Goin JE, Granger CV, Fiedler RC, Williams SV.** Development of function-related groups version 2.0: a classification system for medical rehabilitation. *Health Serv Res.* 1997, Vol. 32(4), pp. 529-48.
61. **Center for Post-acute Studies.** *Bundling Payment for Post-acute Care: Building Blocks and Policy Options.* Washington, DC : National Rehabilitation Hospital. Available from: www.postacuteconference.org, 2009.
62. **Kramer A, Holthaus D (eds).** *Uniform Patient Assessment for Post-Acute Care: Final Report.* Aurora : US Division of Health are Policy and Research, 2006. Available from: <https://www.cms.gov/QualityInitiativesGenInfo/downloads/QualityPACFullReport.pdf>.
63. **Johnston MV, Graves D.** The Uniform Postacute Assessment Tool: Systematically evaluating the quality of measurement evidence. *Arch Phys Med Rehabil.* 2007, Vol. 88, pp. 1505-12.
64. **US Policy Council.** Post-Acute Care Reform Plan. 2006, Available on www.cms.hhs.gov/SNFPPS/Downloads/pac_reform_plan_2006.pdf.
65. **McKinley KE, Berry SA, Laam LA, Doll MC, Brin KP, Bothe A Jr, Godfrey MM, Nelson EC, Batalden PB.** Clinical microsystems, Part 4. Building innovative population-specific mesosystems. *Jt Comm J Qual Patient Saf.* 2008, Vol. 34(11), pp. 655-63.
66. **Bergman, R.** No accreditation, no contract, say most managed care plans. *Hosp Health Netw.* 1994, Vol. 68(21), p. 64.
67. **Beatty PW, Neri MT, Bell K, DeJong G.** Use of outcomes information in acute inpatient rehabilitation. *Am J Phys Med Rehabil.* 2004, Vol. 83(6), pp. 468-78.

68. **DeJong G, Horn SD, Conroy B, Nichols D, Heulton EB.** Opening the black box of post-stroke rehabilitation: stroke rehabilitation patients, processes, and outcomes. *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S1-S7.
69. **Clohan DB, Durkin EM, Hammel J, Murray P, Whyte J, Dijkers M, Gans BM, Graves DE, Heinemann AW, Worsowicz G.** Postacute Rehabilitation research and policy recommendations. *Arch Phys Med Rehabil.* 2007, Vol. 88, pp. 1535-41.
70. **Bjorner JB, Chang CH, Thissen D, Reeve BB.** Developing tailored instruments: item banking and computerized adaptive assessment. *Qual Life Res.* 2007, Vol. 16 Suppl 1, pp. 95-108.
71. **Cook KF, O'Malley KJ, Roddey TS.** Dynamic assessment of health outcomes: time to let the CAT out of the bag? *Health Serv Res.* 2005, Vol. 40(5 Pt 2), pp. 1694-711.
72. **Cella D, Gershon R, Lai JS, Choi S.** The future of outcomes measurement: item banking, tailored short-forms, and computerized adaptive assessment. *Qual Life Res.* 2007, Vol. 16 (Suppl 1), pp. 133-41.
73. **Duncan PW, Velozo C.** State-of-the-science on Postacute Rehabilitation: Measurement and methodologies for assessing quality and establishing policy for Postacute Care. *Arch Phys Med Rehabil.* 2007, Vol. 88, pp. 1482-7.
74. **Haley SM, Siebens H, Coster WJ, Tao W, Black-Schaffer RM, Gandek B, Sinclair SJ, Ni P.** Computerized adaptive testing for follow-up after discharge from inpatient rehabilitation: I. Activity outcomes. *Arch Phys Med Rehabil.* 2006, Vol. 87(8), pp. 1033-42.
75. **Haley SM, Gandek B, Siebens H, Black-Schaffer RM, Sinclair SJ, Tao W, Coster WJ, Ni P, Jette AM.** Computerized adaptive testing for follow-up after discharge from inpatient rehabilitation: II. Participation outcomes. *Arch Phys Med Rehabil.* 2008, Vol. 89(2), pp. 275-83.
76. **Bode RK, Hahn EA, DeVellis R, Cella D e Group, Patient-Reported Outcomes Measurement Information System Social Domain Working.** Measuring participation: the Patient-Reported Outcomes Measurement Information System experience. *Arch Phys Med Rehabil.* 2010, Vol. 91(9 Suppl), pp. S60-5.
77. **Heinemann AW, Tulskey D, Dijkers M, Brown M, Magasi S, Gordon W, DeMark H.** Issues in participation measurement in research and clinical applications. *Arch Phys Med Rehabil.* 2010, Vol. (9 Suppl), pp. S72-6.
78. **Dijkers, MP.** Issues in the conceptualization and measurement of participation: an overview. *Arch Phys Med Rehabil.* 2010, Vol. 91(9 Suppl), pp. S5-16.
79. **Hahn EA, DeVellis RF, Bode RK, Garcia SF, Castel LD, Eisen SV, Bosworth HB, Heinemann AW, Rothrock N, Cella D e Group., PROMIS Cooperative.** Measuring social health in the patient-reported outcomes measurement information system (PROMIS): item bank development and testing. *Qual Life Res.* 2010, Vol. 19(7), pp. 1035-44.
80. **Iezzoni, LL.** Risk adjusting rehabilitation outcomes: an overview of methodologic issues. *Am J Phys Med Rehabil.* 2004, Vol. 83(4), pp. 316-26.
81. **Casalino, LP.** The unintended consequences of measuring quality on the quality of medical care. *NEJM.* 1999, Vol. 341, pp. 1147-50.
82. **Werner, RM e Asch, DA.** Clinical concerns about clinical performance measurement. *Ann Fam Med.* 2007, Vol. 5, pp. 159-63.
83. **Snyder L, Neubauer RL, American College of Physicians Ethics Professionalism and Human Rights Committee.** Pay-for-performance principles that promote patient-centered care: an ethics manifesto. *Ann Intern Med.* 4;147(11), 2007, pp. 792-4.
84. **Whiteneck G, Gassaway J.** SCIRehab: a model for rehabilitation research using comprehensive person, process and outcome data. *Disabil Rehabil.* 2010, Vol. 32(12), pp. 1035-42.
85. **Gassaway J, Horn SD, DeJong G, Smout RJ, Clark C, James R.** Applying the clinical practice improvement approach to stroke rehabilitation: methods used and baseline results. *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S16-S33.
86. **Hoening, H, Duncan, P e Horner, R.** Structure, process, and outcomes in stroke rehabilitation. *Med Care.* 2002, Vol. 40(11), pp. 1036-47.
87. **Kelly A, Thompson JP, Tuttle D, Benesch C, Holloway RG.** Public reporting of quality data for stroke: is it measuring quality? *Stroke.* 2008 Dec; Vol. 39(12), pp. 3367-71.
88. **Aisen, M.** Rehabilitation Redefined. [autor do livro] Compton WD, Grossman JH (editors) Reid PP. *Building a Better Delivery System: A New Engineering/Health Care Partnership.* Washington, DC : National Academics Press, 2005.

Results: 3rd review

89. **Porter ME, Teisberg EO.** *Redefining health care: creating value-based competition on results.* Boston : Harvard Business School Press, 2006.
90. **Strasser DC, Uomoto JM, Smits SJ.** The interdisciplinary team and polytrauma rehabilitation: prescription for partnership. *Arch Phys Med Rehabil.* 2008, Vol. 89(1), pp. 179-181.
91. **Mitus, AJ.** The Birth of InterQual: Evidence-Based Decision Support Criteria That Helped Change Healthcare. *Professional Case Management.* 2008, Vol. 13(4), pp. 228-33.
92. **Poulos CJ, Eagar K, Poulos RG.** Managing the interface between acute care and rehabilitation - can utilisation review assist? *Aust Health Rev.* 2007, Vol. 31(Suppl 1), pp. S129-40.
93. **Poulos, CJ.** Evaluating inpatient public rehabilitation in Australia using a utilization review tool developed in North America. *J Rehabil Med.* 2010, Vol. 42(3), pp. 246-53.
94. **Gassaway J, Whiteneck G, Dijkers M.** Clinical taxonomy development and application in spinal cord injury research: the SCRehab Project. *J Spinal Cord Med.* 2009, Vol. 32(3), pp. 260-9.
95. **Buntin MB, Colla CH, Escarce JJ.** Effects of payment changes on trends in post-acute care. *Health Serv Res.* 2009, Vol. 44(4), pp. 1188-210.
96. **Lin WC, Kane RL, Mehr DR, Madsen RW, Petroski GF.** Changes in the use of postacute care during the initial Medicare payment reforms. *Health Serv Res.* 2006, Vol. 41(4 Pt 1), pp. 1338-56.
97. **Wennberg, JE.** *Variation in Use of Medicare Services Among Regions and Selected Academic Medical Centers: Is More Better?* New York. Available at:
http://www.commonwealthfund.org/usr_doc/874_wennberg_variation_medicare_svcs.pdf : The Commonwealth Fund, 2005.
98. **Buntin MB, Garten AD, Paddock S, Saliba D, Totten M, Escarce JJ.** How much is postacute care use affected by its availability? *Health Serv Res.* 2005, Vol. 40(2), pp. 413-34.
99. **DeJong G, Horn SD, Smout RJ, Ryser DK.** The early impact of the inpatient rehabilitation facility prospective payment system on stroke rehabilitation case mix, practice patterns, and outcomes. *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S93-S100.
100. **Choi S, Davitt JK.** Changes in the Medicare home health care market: the impact of reimbursement policy. *Med Care.* 2009, Vol. 47(3), pp. 302-9.
101. **Yip JY, Wilber KH, Myrtle RC.** The impact of the 1997 Balanced Budget Amendment's prospective payment system on patient case mix and rehabilitation utilization in skilled nursing. *Gerontologist.* 2002, Vol. 42(5), pp. 653-60.
102. **Frymark TB, Mullen RC.** Influence of the prospective payment system on speech-language pathology services. *Am J Phys Med Rehabil.* 2005, Vol. 84(1), pp. 12-21.
103. **Latham NK, Jette AM, Ngo LH, Soukup J, Iezzoni LI.** Did the 1997 balanced budget act reduce use of physical and occupational therapy services? *Arch Phys Med Rehabil.* 2008, Vol. 89(5), pp. 807-14.
104. **Murray PK, Love TE, Dawson NV, Thomas CL, Cebul RD.** Rehabilitation services after the implementation of the nursing home prospective payment system: differences related to patient and nursing home characteristics. *Med Care.* 2005, Vol. 43(11), pp. 1109-15.
105. **Gagnon D, Nadeau S, Tam V.** Ideal timing to transfer from an acute care hospital to an interdisciplinary inpatient rehabilitation program following a stroke: an exploratory study. *BMC Health Serv Res.* 2006, Vol. 6, p. 151.
106. **Hoening H, Horner RD, Duncan PW, Clipp E, Hamilton B.** New horizons in stroke rehabilitation research. *J Rehabil Res Dev.* 1999, Vol. 36(1), pp. 19-31.
107. **Hoening, H, Sloane, R e Horner, RD.** A taxonomy for classification of stroke rehabilitation services. *Arch Phys Med Rehabil.* 2000, Vol. 37, pp. 483-91.
108. **Duncan PW, Horner RD, Reker DM, Samsa GP, Hoening H, Hamilton B, LaClair BJ, Dudley TK.** Adherence to Postacute Rehabilitation guidelines is associated with functional recovery in stroke. *Stroke.* 2002, Vol. 33, pp. 167-78.
109. **Reker DM, Duncan PW, Horner RD, Hoening H, Samsa GP, Hamilton BB, Dudley TK.** Postacute guideline compliance is associated with greater patient satisfaction. *Arch Phys med Rehabil.* 2002, Vol. 83, pp. 750-6.
110. **DeJong G, Hsieh CH, Gassaway J, Horn SD, Smout RJ, Putman K, James R, Brown M, Newman EM, Foley MP.** Characterizing rehabilitation services for patients with knee and hip replacement in skilled nursing facilities and inpatient rehabilitation facilities. *Arch Phys Med Rehabil.* 2009, Vol. 90(8), pp. 1269-83.

Results: 3rd review

111. **Stineman MG, Chan L.** Commentary on the comparative effectiveness of alternative settings for joint replacement rehabilitation. *Arch Phys Med Rehabil.* 2009, Vol. 90(8), pp. 1257-9.
112. **Whiteneck G, Gassaway J, Dijkers M, Jha A.** New approach to study the contents and outcomes of spinal cord injury rehabilitation: the SCIRehab Project. *J Spinal Cord Med.* 2009, Vol. 32(3), pp. 251-9.
113. **Hart, T.** Treatment definition in complex rehabilitation interventions. *Neuropsychol Rehabil.* 2009, Vol. 19(6), pp. 824-40.
114. **Jette, A.** Commentary: The Post-Stroke Rehabilitation Outcomes Project. *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S124-5.
115. **Maulden SA, Gassaway J, Horn SD, Smout RJ, DeJong G.** Timing of initiation of rehabilitation after stroke. *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S34-S40.
116. **Horn SD, DeJong G, Smout RJ, Gassaway J, James R, Conroy B.** Stroke rehabilitation patients, practice, and outcomes: is earlier and more aggressive therapy better? *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S101-S114.
117. **Deutsch A, Granger CV, Heinemann AW, Fiedler RC, DeJong G, Kane RL, Ottenbacher KJ, Naughton JP, Trevisan M.** Poststroke rehabilitation: outcomes and reimbursement of inpatient rehabilitation facilities and subacute rehabilitation programs. *Stroke.* 2006, Vol. 37(6), pp. 1477-82.
118. **Deutsch A, Granger CV, Fiedler RC, DeJong G, Kane RL, Ottenbacher KJ, Heinemann AW, Naughton JP, Trevisan M.** Outcomes and reimbursement of inpatient rehabilitation facilities and subacute rehabilitation programs for Medicare beneficiaries with hip fracture. *Med Care.* 2005, Vol. 43(9), pp. 892-901.
119. **Dejong G, Horn SD, Smout RJ, Tian W, Putman K, Gassaway J.** Joint replacement rehabilitation outcomes on discharge from skilled nursing facilities and inpatient rehabilitation facilities. *Arch Phys Med Rehabil.* 2009, Vol. 90(8), pp. 1284-96.
120. **DeJong G, Tian W, Smout RJ, Horn SD, Putman K, Hsieh CH, Gassaway J, Smith P.** Long-term outcomes of joint replacement rehabilitation patients discharged from skilled nursing and inpatient rehabilitation facilities. *Arch Phys Med Rehabil.* 2009, Vol. 90(8), pp. 1306-16.
121. **DeJong G, Tian W, Smout RJ, Horn SD, Putman K, Smith P, Gassaway J, Davanzo JE.** Use of rehabilitation and other health care services by patients with joint replacement after discharge from skilled nursing and inpatient rehabilitation facilities. *Arch Phys Med Rehabil.* 2009, Vol. 90(8), pp. 1297-305.
122. **Mallinson TR, Bateman J, Tseng HY, Manheim L, Almagor O, Deutsch A, Heinemann AW.** A comparison of discharge functional status after rehabilitation in skilled nursing, home health, and medical rehabilitation settings for patients after lower-extremity joint replacement surgery. *Arch Phys Med Rehabil.* 2011, Vol. 92(5), pp. 712-20.
123. **Lewsey JD, Leyland AH, Murray GD, Boddy FA.** Using routine data to complement and enhance the results of randomised controlled trials. *Health Technol Assess.* 2000, Vol. 4(22), pp. 1-55.
124. **Johnston MV, Sherer M, Whyte J.** Applying evidence standards to rehabilitation research. *Am J Phys Med Rehabil.* 2006, Vol. 85(4), pp. 292-309.
125. **Horn SD, DeJong G, Ryser DK, Veazie PJ, Teraoka J.** Another look at observational studies in rehabilitation research: going beyond the holy grail of the randomized controlled trial. *Arch Phys Med Rehabil.* 2005, Vol. 86(12 Suppl 2), pp. S8-S15.
126. **Horn SD, Gassaway J.** Practice based evidence: incorporating clinical heterogeneity and patient-reported outcomes for comparative effectiveness research. *Med Care.* 2010, Vol. 48(6 Suppl), pp. S17-22.
127. **Horn SD, Gassaway J.** Practice-based evidence study design for comparative effectiveness research. *Med Care.* 2007, Vol. 45(10 Suppl 2), pp. S50-7.
128. **Komaroff E, DeLisa JA.** Best research evidence for physical medicine and rehabilitation. *J Spinal Cord Med.* 2009, Vol. 32(1), pp. 3-5.
129. **Ebenbichler G, Kerschman-Schindl K, Brockow T, Resch KL.** The future of physical & rehabilitation medicine as a medical specialty in the era of evidence-based medicine. *Am J Phys Med Rehabil.* 2008, Vol. (1), pp. 1-3.
130. **Kersten P, Ellis-Hill C, McPherson KM, Harrington R.** Beyond the RCT - understanding the relationship between interventions, individuals and outcome - the example of neurological rehabilitation. *Disabil Rehabil.* 2010, Vol. 32(12), pp. 1028-34.

Results: 3rd review

131. **Westfall JM, Mold J, Fagnan L.** Practice-based research--"Blue Highways" on the NIH roadmap. *JAMA.* 2007, Vol. 297(4), pp. 403-6.
132. **Dejong G, Horn SD, Gassaway JA, Slavin MD, Dijkers MP.** Toward a taxonomy of rehabilitation interventions: Using an inductive approach to examine the "black box" of rehabilitation. *Arch Phys Med Rehabil.* 2004, Vol. 85(4), pp. 678-86.
133. **Horn SD, Bender SA, Ferguson ML, Smout RJ, Bergstrom N, Taler G, Cook AS, Sharkey SS, Voss AC.** The National Pressure Ulcer Long-Term Care Study: pressure ulcer development in long-term care residents. *J Am Geriatr Soc.* 2004, Vol. 52(3), pp. 359-67.
134. **Berlowitz DR, Stineman M.** Risk adjustment in rehabilitation quality improvement. *Top Stroke Rehabil.* 2010, Vol. 17(4), pp. 252-61.
135. **Stineman MG, Charles J, Kurichi JE.** Grading: an annotated "pen and paper" approach to multidimensional case-mix-adjusted continuous quality improvement. *Top Stroke Rehabil.* 2010, Vol. 17(4), pp. 262-70.
136. **Glasgow RE, Magid DJ, Beck A, Ritzwoller D, Estabrooks PA.** Practical clinical trials for translating research to practice: design and measurement recommendations. *Med Care.* 2005, Vol. 43(6), pp. 551-7.
137. **Tunis SR, Stryer DB, Clancy CM.** Practical clinical trials: increasing the value of clinical research for decision making in clinical and health policy. *JAMA.* 2003, Vol. 290(12), pp. 1624-32.
138. **Mold JW, Gregory ME.** Best practices research. *Fam Med.* 2003, Vol. 35, pp. 131-4.
139. **Granger CV, Reistetter TA, Graham JE, Deutsch A, Markello SJ, Niewczyk P, Ottenbacher KJ.** The Uniform Data System for Medical Rehabilitation: report of patients with hip fracture discharged from comprehensive medical programs in 2000-2007. *Am J Phys Med Rehabil.* 2011, Vol. 90(3), pp. 177-89.
140. **Granger CV, Markello SJ, Graham JE, Deutsch A, Reistetter TA, Ottenbacher KJ.** The uniform data system for medical rehabilitation: report of patients with traumatic brain injury discharged from rehabilitation programs in 2000-2007. *Am J Phys Med Rehabil.* 2010, Vol. 89(4), pp. 265-78.
141. **Granger CV, Markello SJ, Graham JE, Deutsch A, Ottenbacher KJ.** The uniform data system for medical rehabilitation: report of patients with stroke discharged from comprehensive medical programs in 2000-2007. *Am J Phys Med Rehabil.* 2009, Vol. 88(12), pp. 961-72.
142. **Noonan VK, Kopec JA, Noreau L, Singer J, Chan A, Mâsse LC, Dvorak MF.** Comparing the content of participation instruments using the international classification of functioning, disability and health. *Health Qual Life Outcomes.* 2009, Vol. 7, p. 93.
143. **Magasi S, Post MW.** A comparative review of contemporary participation measures' psychometric properties and content coverage. *Arch Phys Med Rehabil.* 2010, Vol. 91(9 Suppl), pp. S17-28.
144. **Noreau L, Boschen K.** Intersection of participation and environmental factors: a complex interactive process. *Arch Phys Med Rehabil.* 2010, Vol. 91(9 Suppl), pp. S44-53.
145. **Mallinson T, Hammel J.** Measurement of participation: intersecting person, task, and environment. *Arch Phys Med Rehabil.* 2010, Vol. 91(9 Suppl), pp. S29-33.
146. **World Health Organization.** *ICF: International Classification of functioning, disability, and health.* Geneva : WHO, 2001.
147. **Jelsma, J.** Use of the International Classification of Functioning, Disability and Health: a literature survey. *J Rehabil Med.* 41(1), 2009, pp. 1-12.
148. **Schuntermann, MF.** The implementation of the International Classification of Functioning, Disability and Health in Germany: experiences and problems. *Int J Rehabil Res.* 28(2), 2005, pp. 93-102.
149. **Perenboom, RJ e Chorus, AM.** Measuring participation according to the International Classification of Functioning, Disability and Health (ICF). *Disabil Rehabil.* 25(11-12), 2003, pp. 577-87.
150. **Heinemann AW, Lai JS, Magasi S, Hammel J, Corrigan JD, Bogner JA, Whiteneck GG.** Measuring participation enfranchisement. *Arch Phys Med Rehabil.* 2011, Vol. 92(4), pp. 564-71.
151. **Whiteneck GG, Dijkers MP, Heinemann AW, Bogner JA, Bushnik T, Cicerone KD, Corrigan JD, Hart T, Malec JF, Millis SR.** Development of the participation assessment with recombined tools-objective for use after traumatic brain injury. *Arch Phys Med Rehabil.* 2011, Vol. 92(4), pp. 542-51.

Results: 3rd review

152. **Whiteneck GG, Bogner JA, Heinemann AW.** Advancing the measurement of participation. *Arch Phys Med Rehabil.* 2011, Vol. 92(4), pp. 540-1.
153. **Batalden P, Leach D, Swing S, Dreyfus H, Dreyfus S.** General competencies and accreditation in graduate medical education. *Health Aff.* 2002, Vol. 21(5), pp. 103-11.
154. **Pasquina PF, Kelly S, Hawkins RE.** Assessing clinical competence in physical medicine & rehabilitation residency programs. *Am J Phys Med Rehabil.* 2003, Vol. 82(6), pp. 473-8.
155. **Elwood D, Kirschner JS, Moroz A, Berliner J.** Exploring systems-based practice in a sample of physical medicine and rehabilitation residency programs. *PM R.* 2009, Vol. 1(3), pp. 223-8.
156. **Webster, JB.** Incorporation of core competency questions into an annual national self-assessment examination for residents in physical medicine and rehabilitation: results and implications. *PM R.* 2009, Vol. 1(3), pp. 229-33.
157. **King, JC.** Psychiatrists as expert decision makers or understanding the efficiency bashing mismanagement of evidence-based medicine. *Am J Phys Med Rehabil.* 2009, Vol. 88(10), pp. 781-90.
158. **Burke DT, DeVito MC, Schneider JC, Julien S, Judelson AL.** Reading habits of physical medicine and rehabilitation resident physicians. *Am J Phys Med Rehabil.* 2004, Vol. 83(7), pp. 551-9.
159. **Burke DT, Judelson AL, Schneider JC, DeVito MC, Latta D.** Reading habits of practicing psychiatrists. *Am J Phys Med Rehabil.* 2002, Vol. 81(10), pp. 779-87.
160. **Corcoran, M.** A busy practitioner's approach to evidence-based practice. *Am J Occup Ther.* 2006, Vol. 60(2), pp. 127-8.
161. **Craik J, Rappolt S.** Enhancing research utilization capacity through multifaceted professional development. *Am J Occup Ther.* 2006, Vol. 60(2), pp. 155-64.
162. **McCluskey A, Lovarini M.** Providing education on evidence-based practice improved knowledge but did not change behaviour: a before and after study. *BMC Med Educ.* 2005, Vol. 5, p. 40.
163. **du Toit SH, Wilkinson AC, Adam K.** Role of research in occupational therapy clinical practice: applying action learning and action research in pursuit of evidence-based practice. *Aust Occup Ther J.* 2010, Vol. 57(5), pp. 318-30.
164. **Stube JE, Jedlicka JS.** The acquisition and integration of evidence-based practice concepts by occupational therapy students. *Am J Occup Ther.* 2007, Vol. 61(1), pp. 53-61.
165. **Menon A, Korner-Bitensky N, Kastner M, McKibbin KA, Straus S.** Strategies for rehabilitation professionals to move evidence-based knowledge into practice: a systematic review. *J Rehabil Med.* 2009, Vol. 41(13), pp. 1024-32.
166. **Tilson, JK.** Validation of the modified Fresno test: assessing physical therapists' evidence based practice knowledge and skills. *BMC Med Educ.* 2010, Vol. 10, p. 38.
167. **Bennett S, Hoffmann T, Arkins M.** A multi-professional evidence-based practice course improved allied health students' confidence and knowledge. *J Eval Clin Pract.* 2010.
168. **Parry RH, Brown K.** Teaching and learning communication skills in physiotherapy: what is done and how should it be done? *Physiotherapy.* 2009, Vol. 95(4), pp. 294-301.
169. **Sumsion T, Law M.** A review of evidence on the conceptual elements informing client-centred practice. *Can J Occup Ther.* 2006, Vol. 73(3), pp. 153-62.
170. **Vegni E, Mauri E, D'Apice M, Moja EA.** A quantitative approach to measure occupational therapist-client interactions: a pilot study. *Scand J Occup Ther.* 2010, Vol. 17(3), pp. 217-24.
171. **Sliwa, J, Makoul, G e Betts, H.** Rehabilitation-Specific Communication Skills Training: Improving the physician-patient relationship. *Am J Phys Med Rehabil.* 2002, Vol. 81, pp. 126-32.
172. **Blickem C, Priyadharshini E.** Patient narratives: the potential for "patient-centred" interprofessional learning? *J Interprof Care.* 2007, Vol. 21(6), pp. 619-32.
173. **Reeves S, Russell A, Zwarenstein M, Kenaszchuk C, Conn LG, Doran D, Sinclair L, Lingard L, Oandasan I, Thorpe K, Austin Z, Beales J, Hindmarsh W, Whiteside C, Hodges B, Nasmith L, Silver I, Miller KL, Vogwill V, Strauss S.** Structuring communication relationships for interprofessional teamwork (SCRIPT): a Canadian initiative aimed at improving patient-centred care. *J Interprof Care.* 2007, Vol. 21(1), pp. 111-4.
174. **Reeves, S e Freeth, D.** The London training ward: an innovative interprofessional learning initiative. *J Interprof Care.* 2002, Vol. 16(1), pp. 41-52.

Results: 3rd review

175. **Lindblom P, Scheja M, Torell E, Astrand P, Felländer-Tsai L.** Learning orthopaedics: assessing medical students' experiences of interprofessional training in an orthopaedic clinical education ward. *J Interprof Care.* 2007, Vol. 21(4), pp. 413-23.
176. **Ponzer S, Hylin U, Kusoffsky A, Lauffs M, Lonka K, Mattiasson AC, Nordström G.** Interprofessional training in the context of clinical practice: goals and students' perceptions on clinical education wards. *Med Educ.* 2004, Vol. 38(7), pp. 727-36.
177. **Hansen TB, Jacobsen F, Larsen K.** Cost effective interprofessional training: an evaluation of a training unit in Denmark. *J Interprof Care.* 2009, Vol. 23(3), pp. 234-41.
178. **Eldar, R, Marincek, C e Kullmann, L.** Need for rehabilitation teamwork training in Europe. *Croat Med J.* 2008, Vol. 49, pp. 352-7.
179. **Reeves S, Freeth D, McCrorie P, Perry D.** 'It teaches you what to expect in future . . .': interprofessional learning on a training ward for medical, nursing, occupational therapy and physiotherapy students. *Med Educ.* 2002, Vol. 36(4), pp. 337-44.
180. **Meyer KP, Willett G.** Are physical therapy clinical instructors teaching the Institute of Medicine core competencies? An exploratory investigation using student perceptions. *J Allied Health.* 2007, Vol. 36(4), pp. e293-312.
181. **Buckley JD, Joyce B, Garcia AJ, Jordan J, Scher E.** Linking residency training effectiveness to clinical outcomes: a quality improvement approach. *Jt Comm J Qual Patient Saf.* 2010, Vol. 36(5), pp. 203-8.
182. **Frey K, Edwards F, Altman K, Spahr N, Gorman RS.** The 'Collaborative Care' curriculum: an educational model addressing key ACGME core competencies in primary care residency training. *Med Educ.* 2003, Vol. 37(9), pp. 786-9.
183. **Dobson RT, Stevenson K, Busch A, Scott DJ, Henry C, Wall PA.** A quality improvement activity to promote interprofessional collaboration among health professions students. *Am J Pharm Educ.* 2009, Vol. 73(4), p. 64.
184. **Kim CS, Lukela MP, Parekh VI, Mangrulkar RS, Del Valle J, Spahlinger DA, Billi JE.** Teaching internal medicine residents quality improvement and patient safety: a lean thinking approach. *Am J Med Qual.* 2010, Vol. 25(3), pp. 211-7.
185. **Tess AV, Yang JJ, Smith CC, Fawcett CM, Bates CK, Reynolds EE.** Combining clinical microsystems and an experiential quality improvement curriculum to improve residency education in internal medicine. *Acad Med.* 2009, Vol. 84(3), pp. 326-34.
186. **Voss JD, May NB, Schorling JB, Lyman JA, Schectman JM, Wolf AM, Nadkarni MM, Plews-Ogan M.** Changing conversations: teaching safety and quality in residency training. *Acad Med.* 2008, Vol. 83(11), pp. 1080-7.
187. **Institute of Medicine.** *Crossing the quality chasm.* Washington DC : Natl Acad Press, 2001.
188. **Berwick, D, Nolan, T e Whittington, T.** The Triple Aim: Care, Health, And Cost. *Health Aff.* 2008, Vol. 27(3), pp. 759-69 .
189. **Glickman SW, Baggett KA, Krubert CG, Peterson ED, Schulman KA.** Promoting quality: the health-care organization from a management perspective. *Int J Qual Health Care.* 2007, Vol. 19(6), pp. 341-8.
190. **Bate, P, Mendel, P e Robert, G.** *Organizing for Quality: The Improvement Journeys of Leading Hospitals in Europe and the United States.* NY : Radcliffe, 2008.
191. **Nelson EC, Batalden PB, Godfrey MM.** *Quality By Design: A Clinical Microsystems Approach.* San Francisco : Jossey-Bass, 2007.
192. **Nelson EC, Godfrey MM, Batalden PB, Berry SA, Bothe AE Jr, McKinley KE, Melin CN, Muething SE, Moore LG, Wasson JH, Nolan TW.** Clinical microsystems, part 1. The building blocks of health systems. *Jt Comm J Qual Patient Saf.* 2008, Vol. 34(7), pp. 367-78.
193. **Godfrey MM, Melin CN, Muething SE, Batalden PB, Nelson EC.** Clinical microsystems, Part 3. Transformation of two hospitals using microsystem, mesosystem, and macrosystem strategies. *Jt Comm J Qual Patient Saf.* 2008, Vol. 34(10), pp. 591-603.
194. **Wasson JH, Anders SG, Moore LG, Ho L, Nelson EC, Godfrey MM, Batalden PB.** Clinical microsystems, part 2. Learning from micro practices about providing patients the care they want and need. *Jt Comm J Qual Patient Saf.* 2008, Vol. 34(8), pp. 445-52.
195. **McCarthy, D e Klein, S.** *The Triple Aim Journey: Improving Population Health and Patients' Experience of Care, While Reducing Costs.* Available at:

Results: 3rd review

http://mobile.commonwealthfund.org/~media/Files/Publications/Case%20Study/2010/Jul/Triple%20Aim%20v2/1421_McCarthy_triple_aim_overview_v2.pdf : s.n., 2010.

196. **Van Wave TW, Scutchfield FD, Honoré PA.** Recent advances in public health systems research in the United States. *Annu Rev Public Health.* 2010, Vol. 31, pp. 283-95.
197. **Trochim WM, Cabrera DA, Milstein B, Gallagher RS, Leischow SJ.** Practical challenges of systems thinking and modeling in public health. *Am J Public Health.* 2006, Vol. 96(3), pp. 538-46.
198. **World Health Organization (WHO).** *CBR: A strategy for rehabilitation, equalization of opportunities, poverty reduction and social inclusion of people with disabilities: Joint position paper.* s.l. : WHO. Available at: whqlibdoc.who.int/publications/2004/9241592389_eng.pdf, 2004.
199. **Pope AM, Tarlov AR.** *Disability in America: toward a national agenda for prevention.* Washington, DC : IOM, 1991.
200. **Field MJ, Jette, A (eds).** *The future of disability in America.* Washington, DC : Institute of Medicine, 2007.
201. **National Institute of Disability and Rehabilitation Research.** *NIDRR's Long Range Plan.* 2006. Available at: <http://www.nccdr.org/new/announcements/lrp/fy2005-2009/index.html>.
202. **Martin LA, Nelson EC, Lloyd RC, Nolan TW.** *Whole System Measures.* Cambridge, Massachusetts. Available at: <http://www.ihl.org/IHI/Results/WhitePapers/WholeSystemMeasuresWhitePaper.htm> : IHI Innovation Series white paper., 2007.
203. **Fisher RJ, Gaynor C, Kerr M, Langhorne P, Anderson C, Bautz-Holter E, Indredavik B, Mayo NE, Power M, Rodgers H, Rønning OM, Widén Holmqvist L, Wolfe CD, Walker MF.** A consensus on stroke: early supported discharge. *Stroke.* 2011, Vol. 42(5), pp. 1392-7.
204. **Kergoat MJ, Latour J, Julien I, Plante MA, Lebel P, Mainville D, Bolduc A, Buckland JA.** A discharge summary adapted to the frail elderly to ensure transfer of relevant information from the hospital to community settings: a model. *BMC Geriatr.* 2010, Vol. 10(1), p. 69.
205. **Carlsson E, Ehnfors M, Eldh AC, Ehrenberg A.** Accuracy and continuity in discharge information for patients with eating difficulties after stroke. *J Clin Nurs.* 2011, Vol. May 12 [Epub ahead of print].
206. **Agency for Healthcare Research and Quality.** *Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies: Volume 7—Care Coordination.* Rockville : AHRQ Publication, 2007.
207. **Kellerman R, Kirk L.** Principles of the patient-centered medical home. *Am Fam Physician.* 2007, Vol. 76(6), pp. 774-5.
208. **Carlsson E, Ehnfors M, Ehrenberg A.** Multidisciplinary recording and continuity of care for stroke patients with eating difficulties. *J Interprof Care.* 2010, Vol. 24(3), pp. 298-310.
209. **Kripalani S, LeFevre F, Phillips CO, Williams MV, Basaviah P, Baker DW.** Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. *JAMA.* 2007, Vol. 297(8), pp. 831-41.
210. **Conroy BE, DeJong G, Horn SD.** Hospital-based stroke rehabilitation in the United States. *Top Stroke Rehabil.* 2009, Vol. 16(1), pp. 34-43.
211. **US Policy Council.** Post-Acute Care Reform Plan. 2006, Available on www.cms.hhs.gov/SNFPPS/Downloads/pac_reform_plan_2006.pdf.
212. **Hibbard, JH.** Engaging health care consumers to improve the quality of care. *Med Care.* 2003, Vol. 41(1 Suppl), pp. 161-70.
213. **Scobbie L, Dixon D, Wyke S.** Goal setting and action planning in the rehabilitation setting: development of a theoretically informed practice framework. *Clin Rehabil.* 2011, Vol. 25(5), pp. 468-82.
214. **McPherson KM, Kayes N, Weatherall M e Group, Members of the Goals-SR Research.** A pilot study of self-regulation informed goal setting in people with traumatic brain injury. *Clin Rehabil.* 2009, Vol. 23(4), pp. 296-309.
215. **Taylor WJ, Brown M, William L, McPherson KM, Reed K, Dean S, Weatherall M.** A pilot cluster randomized controlled trial of structured goal-setting following stroke. *Clin Rehabil.* 2011, Vol. [Epub ahead of print].
216. **Playford ED, Siegert R, Levack W, Freeman J.** Areas of consensus and controversy about goal setting in rehabilitation: a conference report. *Clin Rehabil.* 2009, Vol. 23(4), pp. 334-44.

Results: 3rd review

217. **Melvin, J.** Interdisciplinary and multidisciplinary activities and the ACRM. *Arch Phys Med Rehabil.* 1980, Vol. 61, p. 379.
218. **Shut, HA e Stam, HJ.** Goals in rehabilitation teamwork. *Disabil Rehabil.* 1994, Vol. 16, p. 223.
219. **Lohmann S, Decker J, Müller M, Strobl R, Grill E.** The ICF forms a useful framework for classifying individual patient goals in post-acute rehabilitation. *J Rehabil Med.* 2011, Vol. 43(2), pp. 151-5.
220. **Wade, D.** Goal planing in stroke rehabilitation. How? *Top Stroke Rehabil.* 1999, Vol. 6, pp. 16-36.
221. **Rosewilliam S, Roskell CA, Pandyan AD.** A systematic review and synthesis of the quantitative and qualitative evidence behind patient-centred goal setting in stroke rehabilitation. *Clin Rehabil.* 2011, Vol. 25(6), pp. 501-14.
222. **Levack WM, Dean SG, Siegert RJ, McPherson KM.** Navigating patient-centered goal setting in inpatient stroke rehabilitation: How clinicians control the process to meet perceived professional responsibilities. *Patient Educ Couns.* 2011, Vol. [Epub ahead of print].
223. **Schonherr, M, et al.** Prediction of functional outcome after spinal cord injury: a task for the rehabilitation team and patient. *Spinal Cord.* 2000, Vol. 38 (3), pp. 185-91.
224. **Mosqueda, L.** Assessment of rehabilitation potential. *Clin Geriatr Med.* 1993, Vol. 9 (4), pp. 689-703.
225. **Emmons, RA, Colby, PM e Kaiser, HA.** When losses lead to gains: personal goals and recovery of meaning. [autor do livro] PT Wrong e PS Frye. *The human quest for meaning. A handbook of psychological research and clinical applications.* NJ : Lawrence Erlbaum Associates, 1998, pp. 163-78.
226. **Sigurgeirsdottir, J e Halldorsdottir, S.** Existential struggle and self-reported needs of patients in rehabilitation. *J Adv Nurs.* 2008, Vol. 61(4), pp. 384-92.
227. **McKain, S, et al.** Exploration of patients' needs for information on arrival at a geriatric and rehabilitation unit. *J Clin Nurs.* 2005, Vol. 14(6), pp. 704-10.
228. **Ellis-Hill C, Payne S, Ward C.** Using stroke to explore the life thread model: an alternative approach to understanding rehabilitation following an acquired disability. *Disabil Rehabil.* 2008, Vol. 30(2), pp. 150-9.
229. **Mesmer-Magnus, JR e Dechurch, LA.** Information sharing and team performance: a meta-analysis. *J Appl Psychol.* 2009, Vol. 94(2), pp. 535-46.
230. **Stevens AR, Strasser DC, Uomoto J, et al.** Utility of treatment implementation methods in a clinical trial with rehabilitation teams. *J Rehab Res Dev.* 2007, Vol. 44, pp. 537-46.
231. **Mesmer-Magnus JR, Dechurch LA.** Information sharing and team performance: a meta-analysis. *J Appl Psychol.* 2009, Vol. 94(2), pp. 535-46.
232. **Hall WA, Long B, Bermbach N, Jordan S, Patterson K.** Qualitative teamwork issues and strategies: coordination through mutual adjustment. *Qual Health Res.* 2005, Vol. 15(3), pp. 394-410.
233. **Tempest S, McIntyre A.** Using the ICF to clarify team roles and demonstrate clinical reasoning in stroke rehabilitation. *Disabil Rehabil.* 2006, Vol. 28(10), pp. 663-7.
234. **Strasser, D.** Unraveling the conundrum of quality. *Top Stroke Rehabil.* 2010, Vol. 17(4), pp. 225-9.
235. **Hall, WA, et al.** Qualitative teamwork issues and strategies: coordination through mutual adjustment. *Qual Health Res.* 2005, Vol. 15(3), pp. 394-410.
236. **Suddick, K e Souza, LH.** Therapists' experiences and perceptions of teamwork in neurological rehabilitation: Critical happenings in effective and ineffective teamwork. *J Interprof Care.* 2007, Vol. 21 (6), pp. 669-86.
237. **Strasser DC, Falconer JA, Herrin JS, Bowen SE, Stevens AB, Uomoto J.** Team functioning and patient outcomes in stroke rehabilitation. *Arch Phys Med Rehabil.* 2005, Vol. 86(3), pp. 403-9.
238. **Policy Council.** Post-Acute Care Reform Plan. 2006, Available on www.cms.hhs.gov/SNFPPS/Downloads/pac_reform_plan_2006.pdf.
239. **Strasser DC, Falconer JA.** Rehabilitation team process. *Top Stroke Rehabil.* 1997, Vol. 4, pp. 15-27.
240. **Strasser D, Falconer J.** Linking treatment to outcomes through teams: building a conceptual model of rehabilitation effectiveness. *Top Strohe Rehabil.* 1997, Vol. 4, pp. 34-9.

Results: 3rd review

241. **Strasser DC, Falconer JA, Stevens AB, Uomoto JM, Herrin J, Bowen SE, Burrridge AB.** Team training and stroke rehabilitation outcomes. *Arch Phys Med Rehabil.* 2008, Vol. 89, pp. 10-5.
242. **Clarke, DJ.** Achieving teamwork in stroke units: the contribution of opportunistic dialogue. *J Interprof Care.* 2010, Vol. 24(3), pp. 285-97.
243. **Boaro N, Fancott C, Baker R, Velji K, Andreoli A.** Using SBAR to improve communication in interprofessional rehabilitation teams. *J Interprof Care.* 2010, Vol. 24(1).
244. **Andreoli A, Fancott C, Velji K, Baker GR, Solway S, Aimone E, Tardif G.** Using SBAR to communicate falls risk and management in inter-professional rehabilitation teams. *Healthc Q.* 2010, Vol. 13, pp. 94-101.
245. **Ladden MD, Bednash G, Stevens DP, Moore GT.** Educating interprofessional learners for quality, safety and systems improvement. *J Interprof Care.* 2006, Vol. 20(5), pp. 497-505.
246. **Evans CC, Sherer M, Nakase-Richardson R, Mani T, Irby JW Jr.** Evaluation of an interdisciplinary team intervention to improve therapeutic alliance in post-acute brain injury rehabilitation. *J Head Trauma Rehabil.* 2008, Vol. 23(5), pp. 329-38.
247. **Gurr, B.** Staff perceptions of psychological care on a stroke rehabilitation unit. *Br J Nurs.* 2009, Vol. 18(1), pp. 52-6.
248. **Maclean N, Pound P.** A critical review of the concept of patient motivation in the literature on physical rehabilitation. *Soc Sci Med.* 2000, Vol. 50, pp. 495-506.
249. **Strasser DC, Falconer JA, Stevens AB, Uomoto JM, Herrin J, Bowen SE, Burrridge AB.** Team training and stroke rehabilitation outcomes. *Arch Phys Med Rehabil.* 2008, Vol. 89, pp. 10-5.
250. **Reeves S, Zwarenstein M, Goldman J, Barr H, Freeth D, Hammick M, Koppel I.** Interprofessional education: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev.* 2008, Vol. 23(1), p. CD002213.
251. **Cooper, H, Spencer-Dawe, E e McLean, E.** Beginning the process of teamwork: design, implementation and evaluation of an inter-professional education intervention for first year undergraduate students. *J Interprof Care.* 2005, Vol. 19(5), pp. 492-508.
252. **Reker DM, Reid k, Duncan PW, et al.** Development of an integrated stroke outcomes database within Veterans Health Administration. *J Rehabil Res Dev.* 2005, Vol. 42(1), pp. 77-91.
253. **Dougherty D, Conway PH.** The "3T's" Road Map to Transform US Health Care. *JAMA.* 2008, Vol. 299(19), pp. 2319-21.
254. **Corrigan JM, Eden J, Smith BM (eds).** *Leadership by Example: Coordinating Government Roles in Improving Healthcare Quality.* Committee on Enhancing Federal Healthcare Quality Programs. Washington DC : National Academy Press, 2002.