China
Rehabilitation
Market Analysis
and Outlook

October 2016
Introduction

With a short development history in China, currently rehabilitation medicine has a poor recognizability and acceptability to patients and the number of people actually receiving rehabilitation is far lower than that of people who should receive rehabilitation in China. According to statistical yearbook data of the National Health and Family Planning Commission of PRC, inpatients receiving rehabilitation therapy in the rehabilitation department in China reached 1.57 million person-times in 2014, including those who have been admitted to and discharged from hospital for many times, and the number of inpatients who actually received rehabilitation therapy was lower than 1.57 million. In China, there are 138 million old people, among whom up to 70 million are in need of rehabilitation; the elderly have the greatest needs for rehabilitation1.

The huge difference in number between patients actually admitted to hospital and those with potential demand not only indicates that patients attach no importance to rehabilitation therapy, but implies that there is a potentially tremendous rehabilitation market. As people hold a positive attitude toward rehabilitation therapy and show enhanced awareness of rehabilitation, and there are increased reimbursements related to rehabilitation treatment items available from the medical insurance system, more and more patients with potential needs for rehabilitation therapy begin to receive such therapy, and there will be far more inpatients than those acceptable to the current rehabilitation service supply.

Focusing on domestic rehabilitation institutions and their stakeholders, this paper will analyze what different stakeholders care most and its impact on the development of rehabilitation institutions, and investigate the problems in respect of management and operation encountered by rehabilitation institutions in an all-round way.

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Current situation of rehabilitation therapy in China

Total number of populations needing rehabilitation

There is a massive demand for rehabilitation therapy in China. A conservative estimate of the population needing rehabilitation in China is more than 100 million, mainly consisting of four groups:

1. Disabled people: The total number of disabled persons in China by the end of 2010 was calculated as 85.02 million by China Disabled Persons' Federation based on the total population of the Sixth Nationwide Population Census and the results of the Second National Sampling Survey of Disabled Persons, of which more than 50 million need rehabilitation.

2. Old people: According to the statistics from National Bureau of Statistics of China, there were 138 million old people 65 years old or older in China by the end of 2014, accounting for 10.1% of the total population of China. And the number of disabled old people with various chronic diseases who need rehabilitation reached more than 70 million.

3. People with chronic disease(s): There are over 200 million patients with chronic disease(s) in China, among whom more than 10 million are in need of rehabilitation services.

4. Disabled persons with disabilities due to traffic, industrial and/or other injury accidents: The number of this group of people increases by about 1 million annually, most of whom are in need of rehabilitation services.

Sources of demand for rehabilitation

We learned through interviews with clinicians from key Grade-A tertiary hospitals in Shanghai that the main sources of demand for rehabilitation are needs for postoperative rehabilitation of patients from the neurology, neurosurgery, orthopaedics, paediatrics, gynaecology and obstetrics and the cardiopulmonary departments. Well known for its high incidence and disability rate, stroke ranks first in lethal diseases in China and people are generally familiar with it; now postoperative rehabilitation is gradually recognizable and acceptable to stroke patients, so they are the largest population receiving rehabilitation. Patients with orthopedic disorders have a high possibility to become mobility-impaired or disabled after operation (fracture surgery and joint replacement in most cases), so many of them may have to resort to rehabilitation therapy. Moreover, children and postpartum women are well cared for by their families, and the families of most pediatric patients or postpartum women are willing to pay for rehabilitation.

Fig 1: Total number of populations needing rehabilitation

Fig 2: Disease Structure of rehabilitation patients

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2 China Disabled Persons' Federation. Notice on the Use of the Total Number of Disabled Persons and the Number of Disabled Persons with Different Types and Levels of Disabilities by the End of 2010. 2012

**Stakeholders of for-profit rehabilitation institutions**

For-profit rehabilitation institutions are mainly related to six major stakeholders in the whole industry chain from the upstream to downstream industries: patients, clinicians, governments, and rehabilitation institution investors, managers, and medical personnel.

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**Fig 3: Stakeholders of for-profit rehabilitation institutions**
Patients

Benefits of rehabilitation therapy for patients

Clinical medicine is aimed at diseases, placing emphasis on elimination of etiologic factors and reversal of pathological or pathological and physiological abnormalities. For many diseases, however, it is difficult to eliminate etiologic factors, or even if etiologic factors have been eliminated, automatic recovery from the resulting severe dysfunction may not be achieved. The limitation of clinical medicine has prompted the development of rehabilitation medicine, which is aimed at the recovery from dysfunction.

In general, rehabilitation can lower clinical disability rates, increase patients’ self-care ability and improve their life quality. For instance, the recurrent mortality of survivors of myocardial infarction was reduced by 36.8% after rehabilitation therapy. Through rehabilitation therapy, 90% of patients with stroke regained the ability to walk and care themselves, and 30% of patients can do light work, whereas the corresponding percentages of patients who received no rehabilitation services are 6% and 5%, respectively. For traumas, such as traumatic paraplegia, patients could only survive for 2.9 years before 1950, but their survival period reached 5.9 years after 1950. 83% of these patients were able to return to work or school thanks to the development of rehabilitation medicine. Due to the development of modern prosthetic technologies, most amputees are able to take care of themselves and find a new job.

The average life span increases with social development, economic prosperity and progress in medical and health services; meanwhile, the aging population gradually increases. Old people not only tend to suffer from various senile and chronic diseases, but their recovery time is long, often leaving dysfunction of different degrees which needs to be treated with rehabilitation therapy.

Fig 4: Benefits of rehabilitation therapy for patients

Comparison between stroke patients treated with and without rehabilitation

<table>
<thead>
<tr>
<th></th>
<th>Receiving rehabilitation therapy</th>
<th>Not receiving rehabilitation therapy</th>
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<tbody>
<tr>
<td>Able to walk and take care of themselves</td>
<td>90%</td>
<td>6%</td>
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<tr>
<td>Able to do light work</td>
<td>30%</td>
<td>5%</td>
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Survival time of patients with paraplegia

<table>
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<th>Before 1950</th>
<th>After 1950</th>
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<tr>
<td>Receiving rehabilitation therapy</td>
<td>5.9 years</td>
<td>83%</td>
</tr>
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</table>

Patients as a whole have poor awareness of rehabilitation

Today the Chinese traditional concept that "It takes at least one hundred days for injured sinews or bones to heal" still influence the common people, especially the elderly patients, who choose to recuperate at home after operation and lead a life of poor quality. In fact, a big chance of improvement may be obtained, or the body functions may return to the state before illness if rehabilitation therapy is received within half a year postoperatively.

In China, patients depend on clinicians and follow their advice and suggestions. Although patients have the right to make the final decision, medical decisions are largely influenced by clinicians. Therefore, as rehabilitation therapy has not been completely accepted by all people today, the dissemination and education of rehabilitation by clinicians among postoperative patients will to a large extent enhance people’s awareness and recognition of rehabilitation.

And for patients receiving rehabilitation therapy, a good and positive attitude toward rehabilitation will directly affect their rehabilitation effects. Rehabilitation therapy is a long and hard process. Inpatients begin to receive rehabilitation training after 9 o'clock AM and the training ends at about 4 or 5 o'clock PM. They can attend 4-5 sessions of rehabilitation training or treatment at most per day. All the apparently simple walking and exercise training is a challenge for patients receiving rehabilitation. So patients' own positive attitude is positively correlated with rehabilitation effects. On the other hand, rehabilitation therapists and physicians also suggest that the family members of patients actively participate in rehabilitation activities and encourage the patients constantly to increase the confidence of the patients.

Factors influencing the choice of rehabilitation institutions by patients

1. Public opinions
Rehabilitation medicine at the present stage is a new concept to many people, and poor recognition is also reflected in hospital selection. From knowing nothing about rehabilitation to learning something about it and to accepting it and selecting a rehabilitation institution, patients and their family members continually receive information from the outside world, and their decisions are often influenced by external opinions and comments.

Patients' "first teachers" of rehabilitation are usually their attending physicians. When patients decide to start rehabilitation therapy after being enlightened in this respect, they generally ask their attending physicians for suggestions as to which institutions they will choose. The hospital recommended may not be the treatment facility a patient finally chooses, but that hospital will surely be in the list of hospitals subject to his/her preliminary investigation.

On the other hand, positive experiences of relatives and friends exert further impact on patients' choice. Different from suggestions from attending physicians, treatment experiences of relatives and friends are something patients want most that offer them direct information. So many patients follow the recommendations of their relatives and friends regarding the selection of a rehabilitation hospital.

Fig 5: Factors influencing the choice of rehabilitation institutions by patients

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5 www.chinanews.com. Survey: Caring only for recuperation Merely ten percent patients have the awareness of rehabilitation therapy. 2014
2. Designated hospitals of medical insurance

Chinese people stick to traditional medical concepts and a designated hospital of medical insurance is their first choice when it comes to medical advice and treatment.

First of all, a designated hospital of medical insurance must be subject to a professional process of examination and approval by authorities before being eligible. So “designated hospitals of medical insurance” are regarded as an “official certification” by the people, and only hospitals approved by the government are regular hospitals in their mind. After a series of serious medical incidents including “Putian Incident”, people become more cautious and careful when choosing a medical institution. It goes without saying that basically designated hospitals of medical insurance can guarantee medical quality.

On the other hand, the availability of medical insurance reimbursements is also a main reason why the general public chooses a designated hospital of medical insurance. Choosing a non-designated hospital of medical insurance means patients give up the benefits of medical insurance reimbursements and pay for medical treatment by themselves. As rehabilitation is the treatment after the acute stage of disease, it is not so urgent as surgical treatment and the recovery effect of patients using it is uncertain, medical institutions where payment via medical insurance reimbursements is available are more attractive to most patients who just want to “have a try”.

3. Distance

Patients receiving rehabilitation therapy fall into two categories by the disease stage: 1) Rehabilitation during the postoperative acute stage; 2) Regular rehabilitation during the stable stage. Different categories of patients have quite different demands for the distance of a rehabilitation institution.

For patients at the acute stage, it is preferable that they receive targeted and comprehensive rehabilitation therapy in hospital one to two months after operation. At this time patients stay in hospital all day long. They only need to travel when being admitted to hospital. Therefore, the slightly remote location of medical institutions focusing on inpatient rehabilitation therapy will not have too much influence on the choice of patients. Taking the convenience of visiting family members into consideration, PricewaterhouseCoopers thinks that generally inpatient rehabilitation institutions can attract patients less than two-hour drive away from them.

For patients at the stable stage, their first choice is rehabilitation therapy at the outpatient department. Each session of rehabilitation at the outpatient department doesn't take too much time, but usually two to three sessions are required per week. So the choice of this kind of patients is greatly impacted by the location of hospital, most of them choose medical institutions less than 30-minute drive away from their residences, such as community health service station, governmental hospitals within the urban area and specialist rehabilitation hospitals with a superior geographical location.

4. Specialists

In the field of medical treatment, a team of top specialists in the subject not only reflects the strength of the medical institution owning that team, but help that institution gain trust from a lot of patients. Taking Shanghai Huashan Hospital as an example, under the leadership of Prof. Yi Wu, a rehabilitation medicine specialist, a number of doctors and therapists in the Department of Rehabilitation Medicine have developed strong academic and practical ability. The Rehabilitation Hall of General Huashan Hospital in which only outpatient services are available is overcrowded with patients every day. Some patients have even received rehabilitation therapy in Huashan Hospital for more than a decade, keeping in close contact with the rehabilitation team of the hospital. The sense of trust of the great majority of patients due to the techniques and medical culture brought by top specialists will not develop if only high-end medical equipment is available.

5. Services

With the economic growth and the improvement of people’s living standard, more and more patients and families are concerned with the medical environment and the availability of relevant facilities when choosing a medical institution and considering the medical skills. Under the background of current public health in China, the medical environment and services have been the weakness of public hospitals; whereas services enabling patients and families to feel at home as provided by private hospitals are a value-added point. There are many families in Beijing, Shanghai and other first-tier cities which are willing to pay a significant premium for services.
The orientation of medical treatment in China results in a lack of rehabilitation experience among clinicians

Medical science consists of prevention medicine, treatment medicine, health care medicine and rehabilitation medicine. As an emerging concept of the mid-twentieth century, rehabilitation medicine has a relatively poor recognizability and acceptability in the society. The current medical treatment focuses on treatment medicine in China, which means that doctors lay more emphasis on surgical operation and have contempt for rehabilitation. The orientation of treatment medicine has made a lot of surgical clinicians pay more attention to knowledge of surgical techniques and disease diagnosis, resulting in a paucity of systematic and professional rehabilitation experience.

According to 2014 health statistical yearbook of the National Health and Family Planning Commission of PRC, beds in the rehabilitation medicine department (including specialist rehabilitation hospitals and the rehabilitation medicine department of general hospitals) just account for 2.1% of the total beds in medical and health institutions; whereas beds in departments upstream of the rehabilitation medicine department (e.g. the surgical department) can reach up to 18.97%. The great difference in bed number highlights the fact that little importance is attached to the rehabilitation medicine department.

But rehabilitation therapy is an effective means to improve clinical efficacy. Professor Rusk, a famous American rehabilitation medicine specialist, believes that rehabilitation therapy is the subsequent work of clinical treatment, and the lack of rehabilitation means that clinical work has not been finished yet. Clinical rehabilitation practice also confirms the promoting effect of rehabilitation on clinical efficacy. Among survivors of myocardial infarction, those receiving rehabilitation therapy had a mortality 36.8% lower than those not receiving rehabilitation. In addition, among survivors of cerebralvascular disease, 90% of those receiving rehabilitation therapy regained the ability to walk and take care of themselves and 30% were able to do light work, whereas the corresponding percentages of those not receiving rehabilitation therapy were only 6% and 5%, respectively.

The referral mechanism of rehabilitation therapy remains to be improved

An effective mechanism of referral from the clinical department to the rehabilitation department or a rehabilitation hospital provides a green channel for postoperative patients in need of rehabilitation. Such a green channel can effectively eliminate the referral barrier between upstream and downstream departments and dispel misgivings of patients and their families, which will encourage more patients to receive rehabilitation therapy in a timely manner. Through visits to a number of general hospitals and specialist rehabilitation hospitals, we learned that currently there are three referral mechanisms of rehabilitation therapy in China, i.e. intra-hospital referral mechanism, inter-hospital cooperative referral, and referral upon personal recommendation by clinician(s).

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1. Inter-department referral

Inter-department referral in a general hospital is simple relative to other modes of referral. After operation in the clinical department and the patient's condition is stable, the patient may be transferred to the ward of the rehabilitation medicine department in the same hospital.

With a strong awareness of rehabilitation and good hospital management procedure, high-end private hospitals (such as Beijing United Family hospital) have developed a rapid and perfect intra-hospital referral mechanism. Surgeons design a global recovery procedure and recommend it to patients before neurosurgical operation, if patients agree to accept that recovery procedure, they can be transferred to the United Family Rehabilitation Hospital 3-5 days postoperatively to receive professional rehabilitation therapy.

As an excellent representative of public Grade-A tertiary hospital, Shanghai Huashan Hospital has not provided beds for rehabilitation in the Department of Rehabilitation Medicine of its general hospital where only outpatient services are available. But the Department of Rehabilitation Medicine sends one to two rehabilitation physicians to every clinical department to provide bed-side rehabilitation services for some postoperative acute-stage patients. After the postoperative acute stage, if patients want to continue staying in hospital for rehabilitation, they can choose to be transferred to the rehabilitation ward of any branch of Huashan Hospital, such as the northern and eastern branches.

However, the vast majority of Grade-A tertiary hospitals have very few or no beds for rehabilitation, so a large number of rehabilitation needs can not be met through their internal referral mechanism.
2. Inter-hospital cooperative referral

Referral agreements between hospitals are difficult to implement, because the level of treatment of a low-level rehabilitation hospital is difficult to be guaranteed, and clinicians worry that improper rehabilitation skills and technologies may exert unexpected influence on patients’ recovery. Therefore, many clinicians hope to have more chances to participate in later-stage rehabilitation therapy consultation to guarantee the therapeutic level and take timely intervention measures in the case of a deteriorating condition. When it comes to actual operation, in-depth cooperation between most Grade-A tertiary hospitals and a secondary rehabilitation hospital is hard to carry out. In a few successful cooperation models, doctors of a Grade-A tertiary hospital have to spend a lot of time and energy in the early stage of cooperation. But as cooperation continues the therapeutic level of the rehabilitation hospital increases and the Grade-A tertiary hospital gradually reduces its participation in rehabilitation.

A perfect two-way referral mechanism has been developed between Renji Hospital Shanghai Jiao tong University School of Medicine and Anda Hospital in Pudong. After neurosurgical operation in Renji Hospital, patients needing rehabilitation can be transferred to Anda Hospital for rehabilitation therapy. In case of deterioration or recurrence, Anda Hospital will immediately transfer the patients back to Renji Hospital. Renji Hospital gives priority to admission of transferred patients due to such a two-way referral mechanism. Doctors from Renji Hospital will provide systematic training programs for those of Anda Hospital, disclosing the information about surgical operation in detail, and doctors of both hospitals discuss and develop rehabilitation plans. During the early stage of cooperative referral, doctors of Renji Hospital go to Anda Hospital to make the rounds of the wards and participate in consultation so as to keep abreast of patients’ recovery and point out and intervene in the wrong treatment by rehabilitation therapists or nurses in a timely manner. After years of cooperation, the overall strength of the Department of Rehabilitation Medicine of Anda Hospital has been promoted rapidly, and the number of rounds of Renji Hospital decreases gradually.

Prior to the development of the referral mechanism for patients needing rehabilitation with Anda Hospital, Renji Hospital was cooperating with another secondary hospital with years of experience in rehabilitation therapy. However, that secondary hospital itself had many patients receiving rehabilitation, paid little attention to patients recommended by Renji Hospital and failed to interact effectively with clinicians of Renji Hospital, resulting in poor postoperative rehabilitation effects. Then Renji Hospital considered looking for a new partner.
3. Referral upon personal recommendation by clinician(s)

As regards referral upon personal recommendation, clinicians will first consider the rehabilitation medicine department of their own hospitals and then any rehabilitation institution with which they are cooperating. Clinicians are cautious about recommending other rehabilitation institutions because most of them know little about those institutions; only a few doctors spontaneously acquire information about and visit the rehabilitation medicine department of other secondary hospitals, and offer their suggestions based on their own understanding and experience to patients who have the intention to receive rehabilitation therapy and ask for suggestions regarding referral. On the other hand, clinicians value their own reputation; if the medical institution which they suggest to patients has a poor medical quality and a low service level, their reputation will surely be impacted. So clinicians will not consider recommendation for referral unless they fully understand and trust the target institution.

Fig 8: Referral upon personal recommendation by clinician(s)
Status quo of qualified rehabilitation personnel

Now there is a serious shortage of rehabilitation therapists. Data of 2013 shows that there were about 25,000 practicing doctors in the rehabilitation medicine department of China’s public hospitals, accounting for only 0.9% of the total practicing doctors. In China, the ratio of rehabilitation physicians to the general population was about 0.4:100,000, which was much lower than that of developed countries (5:100,000). President Jian’an Li of the International Society of Physical and Rehabilitation Medicine said, “In the next 5–10 years, at least 300 thousand rehabilitation professionals are required, and rehabilitation therapy will be one of the specialties having the brightest prospect for development”. The short-term paucity of qualified rehabilitation personnel has adverse impact on rapid development of the rehabilitation medicine industry, and the training for relevant personnel is extremely urgent.

Reasons for lack of qualified rehabilitation personnel

Older doctors attach little importance to rehabilitation medicine. Some interviewee said, “Students with good academic performance prefer surgery, a popular major, and those having no other options have to choose rehabilitation medicine.” It is thus evident that medical workers have a prejudice against rehabilitation medicine, so do the public. Also, the difference in salary level between rehabilitation therapists and clinicians is telling. Taking Shanghai as an example, a chief physician from a Grade-A tertiary hospital has an annual salary of about six hundred thousand Yuan, whereas that of a rehabilitation therapist is only a bit more than one hundred thousand Yuan. Chief clinicians and associate chief clinicians can earn extra incomes through endorsement (taking advantage of their professional reputation) in other hospitals, but it is difficult for rehabilitation therapists to do so because they make a living by handicraft.

Therefore, it is hard for the rehabilitation industry to attract excellent medical students due to the common belief of the people and the salary level.

Qualified rehabilitation personnel are increasing

Recently, rehabilitation institutions have begun to realize the problem of lack of qualified rehabilitation personnel with the rapid development of the rehabilitation industry. Now more and more public hospitals begin to attach importance to the attraction to rehabilitation physicians and therapists. Meanwhile, relevant government agencies and medical colleges work jointly to train rehabilitation personnel. Moreover, some private hospitals with sufficient capital and foreign advanced technologies also prepare for their own rehabilitation schools, hoping to introduce outstanding and advanced medical technologies and standards into China to improve the level of rehabilitation therapy in China. We believe that the corresponding personnel training system will become maturer with the establishment of more and more colleges and universities.
Since the development of Guidelines on Construction and Management of the Rehabilitation Medicine Department in General Hospitals and Basic Criteria for the Rehabilitation Medicine Department in General Hospitals (Trial) by the Ministry of Health of China in 2011, the Ministry of Health has strengthened the governance of the rehabilitation medicine department in hospitals in China, and proposed corresponding standards for the number of medical personnel in secondary and tertiary hospitals. For many secondary rehabilitation hospitals which were transformed from public secondary general hospitals, the personnel standards (0.2 doctors, 0.3 nurses and 0.5 rehabilitation therapists for each bed at a minimum) were stringent. In order to meet the latest standards issued by the Ministry of Health, some transformational public secondary rehabilitation hospitals encouraged the original general practitioners to obtain rehabilitation physician qualifications, and appealed to the original nurses to actively participate in in-service training and obtain rehabilitation therapist qualifications. Relevant standards were satisfied through transformation of the original qualified personnel into qualified rehabilitation personnel to increase the number of related employees.

After the transformation from a geriatric hospital in Yangpu District into a rehabilitation hospital, the First Rehabilitation Hospital of Shanghai was in urgent need of rehabilitation physicians and therapists since it was required to reach the national bed to doctor ratio. In addition to external recruitment, the hospital encouraged specialists of the orthopedics department, the surgical department, the cardiology department and other departments to participate in professional rehabilitation training and national qualification examinations for rehabilitation physician/therapist candidates. Over 60 specialists successfully turned into rehabilitation physicians through examinations.
Define the strategic orientation

For managers of rehabilitation institutions, the hospital orientation should be clear first of all. They should start with the study of the relationship between the supply and demand of rehabilitation resources in the area under study to acquire information about the number of old people, disabled people, and patients with work injuries, the traffic accident rate, and the spectrum of disease on the one hand, and investigate the number of rehabilitation institutions, beds, annual visits to the emergency department, outpatient department, and inpatient department, and characteristic departments and talent pool on the other hand. Diseases the hospital is aiming at (e.g., rehabilitation in the neurology department or the orthopedics department) are determined based on study results, then patients' needs (rehabilitation target and period) are analyzed. Then the corresponding pricing strategy and operation mode, etc. are designed based on analysis results. For instance, if postpartum rehabilitation is chosen, the strategy of building a high-end hospital which offers high-quality services can be adopted given that the rehabilitation period is short, and patients generally have good family economic conditions and expect better rehabilitation effects and a higher level of services. As for infantile cerebral palsy, the rehabilitation takes the whole life and a high medical level is required, and patients are usually from less wealthy families, so high medical quality and a reasonable price should be chosen.

In addition, presently rehabilitation hospitals generally aim at "specialization and comprehensiveness." Specialization refers to the provision of professional and comprehensive rehabilitation services for patients, emphasizing the concept of holistic rehabilitation and reflecting the strength of a specialized hospital. Clinical comprehensiveness is an important supportive factor for a rehabilitation hospital. Specialization of rehabilitation needs a clear service pattern and rehabilitation process as well as the availability of a variety of treatment programs for the purpose of providing specialized rehabilitation therapy and standard rehabilitation procedure and achieving information-based rehabilitation management. But clinical comprehensiveness does not mean that the hospital is large and all-inclusive; instead, related clinical departments should be built mainly according to the diseases which rehabilitation is aiming at, taking practicality and sufficiency into account. Taking Xiangya Boai Rehabilitation Hospital as an example, eight specialized rehabilitation centers (including the neuro-rehabilitation center, bone and joint rehabilitation center, spinal cord injury rehabilitation center, and children's rehabilitation center) are built, and the department of internal medicine, surgical department, department of gynaecology, and department of pediatrics are available to meet basic medical needs. In addition, there is a good complementary relationship between it and Xiangya Hospital which allows resource sharing, mutual benefit and double win.

Control the cost within a reasonable range

The biggest cost for a rehabilitation institution is the cost of manpower, which accounts for about half of the total costs. The manpower cost of high- and medium-end rehabilitation institutions has a higher ratio, because the provision of a competitive salary level is an effective guarantee of attracting excellent medical personnel. For instance, some high- and medium-end rehabilitation institutions focusing on foreign advanced technologies attract and introduce foreign medical teams using a salary 5-10 times higher than that for domestic teams of the same level, including the basic wage and a considerable amount of settling-in allowance (housing subsidy, children's tuition and other expenses included).

As regards equipment procurement, there are very big differences between hospitals due to the differences in investment levels; some hospitals are in pursuit of large and all-inclusive, high-grade, precision, and advanced equipment, whereas some need fewer but better devices. In most cases private hospitals have more advanced plants, such as rehabilitation robots, 3D gait analyzer, and hyperbaric oxygen chamber. However, the idleness ratio of these high-end plants is high, and the return on investment is low. For example, an imported rehabilitation robot costs about 3 million Yuan, and it takes 5 years to recover the cost if 300 Yuan/h is charged (calculated based on 8 hours of operation/day and 250 working days/year). Public hospitals
have older facilities partly due to their cumbersome procurement approval process. Some have tried to introduce advanced plants to compete with private hospitals. Some specialists interviewed said that equipment competition is a bottomless pit and meaningless; it is important that plants which meet basic rehabilitation needs should be used rationally by professionals from the perspective of patients.

**Establish channels for talent training and supply**

Some interviewees said that brand endorsement by industry experts would be helpful in building the image of professional quality and attracting more patients. But some said that the appeal of experts is largely dependent upon the reputation of the public hospital they endorse; their attractiveness will reduce significantly without a public hospital. Therefore, from the perspective of experts, many of them are still unwilling to go to work in a private hospital even if multi-sited license is encouraged. And from the angle of private hospitals, personal attendance of experts may not attract more patients. In private hospitals, few patients make appointment with some experts who are very popular in the public hospital, so the performance is not too good relative to the cost of hiring an expert. Therefore, some interviewees said that a good management model should be expert-free and that young people be utilized boldly and trained using management tools and the training system so as to build a professional rehabilitation team and provide patients with cost-effective treatment services.

At present many rehabilitation institutions have been aware of the importance of personnel training, and begin to search for a suitable student pool base used for cooperative training; some also consider establishing their own rehabilitation training schools in the future to train local personnel by introducing the foreign advanced training system.

**Explore innovative business cooperation models**

Apart from direct purchase of rehabilitation equipment, it is also possible to cooperate with equipment manufacturers on rental basis, sharing profits based on how many times the equipment has been used and achieving business binding between manufacturers and hospitals. Also, the sales and leasing of household rehabilitation equipment has a good market potential. Some patients still need rehabilitation equipment to assist in their daily life after being discharged. So far some rehabilitation equipment companies have entered this segment market. For instance, Family of Health, the largest home medical device distributor in China, started in early 2015 the home medical equipment leasing business, integrating leasing, recycling, disinfection, cleaning and service. Now devices for rent include care beds, respirators, oxygenerators, crawler type stair climbers, electric scooters, wheelchairs, etc. Through leasing, patients can not only use high- and medium-end home medical devices at a low cost, but make timely replacement in case of product renewal.

In addition, most rehabilitation institutions choose to cooperate with a commercial insurance company to attract more patients. Presently some high-end commercial medical insurances have covered rehabilitation therapy, charging a high premium from high-income population, the policy holders. Taking Cigna&CMB high-end individual medical insurance as an example, it fully covers rehabilitation and charges a premium about 50 thousand Yuan every year. Now it is cooperating with Shanghai Huashan Hospital, Shanghai United Family Hospital and other rehabilitation institutions. Commercial insurance companies are inclined to cooperate with medical institutions with an International certification (such as JCI Accreditation).
**Successive introduction of favorable policies**

**Encourage investment in medical institutions with private capital**

The policy on running medical institutions with social capital gradually became clear in 2009 after the Opinions about Deepening the Reforms of Medical and Health System was issued. "Everyone has access to basic medical and health services" is the strategic goal of China's medical reforms, thus the keynote of development will be "Meeting basic needs". As the main provider of basis medical services, public hospitals will maintain their leading position in the medical and health service industry. At the same time, the government issued a number of policies (See Table 1: Related policies on running medical institutions with private capital) to encourage and guide social capital to enter the medical service industry more rapidly, so as to expand medical and health resources, relieve the contradiction between supply and demand, and satisfy the increasingly diversified medical needs; as well as to bring the initiative of private hospitals into play and stimulate market competition to help improve the efficiency and quality of public hospitals.

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<th>Time</th>
<th>Issuer</th>
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<th>Main Content</th>
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<td>Apr., 2009</td>
<td>the State Council</td>
<td>Opinions about Deepening the Reform of Medical and Health System</td>
<td>Actively promote the development of non-public medical and health institutions and develop a system of running medical institutions characterized by diversification of investors and investment modes. Actively guide social capital to participate in the restructuring of some public hospitals (including those run by state-own enterprises) in a variety of way. Support qualified persons in starting business according to law to facilitate the masses to seek medical advice</td>
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<td>Feb., 2010</td>
<td>National Health and Family Planning Commission, National Development and Reform Commission</td>
<td>Directive Opinions about Pilot Reforms of Public Hospitals</td>
<td>Relax access restrictions on social capital, encourage social capital to participate in the restructuring of public hospitals, adjust and add medical resources giving priority to social capital; optimize the environment in which medical institutions are run with social capital, including tax and price policies, designated hospitals of medical insurance, environment of human resource development and utilization, academic environment, equipment procurement and government purchase</td>
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<td>Dec., 2010</td>
<td>General Office of the State Council</td>
<td>Opinions about Further Encouraging and Guiding the Establishment of Medical Institutions with Social Capital</td>
<td>Relax access restrictions on running medical institutions with social capital, and adjust and add medical resources giving priority to social capital; further improve the environment in which medical institutions are run with social capital, and encourage the government to purchase services offered by non-public medical and health institutions; create and improve complaint channels for non-public medical and health institutions to promote the sustainable and healthy development of them</td>
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<td>Feb., 2011</td>
<td>General Office of the State Council</td>
<td>Main Work Arrangements for 2011 for Five Key Reforms of Medical and Health System</td>
<td>Strengthen regional health planning, control the establishment of public hospitals, adjust and add medical resources giving priority to social capital; encourage the establishment of ordinary and high-end private medical institutions, and control the percentage of special services offered by public hospitals</td>
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<td>Mar., 2012</td>
<td>General Office of the State Council</td>
<td>Circular about the Plan and Implementation Schedule for Deepening the Reform of Medical and Health System in the 12th Five Year Plan Period</td>
<td>Drive the development of non-public medical institutions, which shall account for 20% of all hospital beds and services provided by 2015; ease market access restrictions to encourage investment in medical institutions by private and foreign investors, and opening of private clinics by qualified professionals; guide private capitals’ involvement in the reform of public hospitals through a number of means; continue to improve business environment, and encourage the development of non-public medical institutions towards high-standard, large-scale medical groups</td>
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<td>Oct., 2013</td>
<td>General Office of the State Council</td>
<td>State Council Opinions about Promoting the Development of Health Service Industry</td>
<td>Re-stresses the task to promote diversified medical structure; provides detailed supplements with regard to easing market access restrictions, overall planning, investment and financing policies and fiscal/tax and price policies</td>
</tr>
<tr>
<td>Nov., 2013</td>
<td>CPC Central Committee</td>
<td>CPC Central Committee Decisions on Certain Critical Issues Concerning Comprehensive Deepening of Reform</td>
<td>Encourage private investment in medical institutions, particularly not-for-profit ones. Private investors may directly invest in fields with resource shortage to satisfy diversified requirements, and participate in public hospital reform and restructuring projects through a number of different means. Medical practitioners may practice in multiple locations. Private medical institutions may be included into the scope of medical insurance</td>
</tr>
<tr>
<td>Time</td>
<td>Issuer</td>
<td>Document</td>
<td>Main Content</td>
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<tr>
<td>Jan, 2014</td>
<td>National Health and Family Planning Commission</td>
<td>Opinions on Accelerating Private Investment in Medical Institutions</td>
<td>Incorporate private hospitals into the scope of overall regional health planning system; encourage private investment in TCM hospitals; develop guidelines for medical practitioners to practice in multiple locations; create favorable conditions to enable renowned, senior TCM practitioners to practice in multiple locations; encourage major public medical institutions to help non-public peers through one-for-one partnerships; support the establishment of independent trade associations of non-public medical institutions</td>
</tr>
<tr>
<td>May, 2014</td>
<td>General Office of the State Council</td>
<td>Key tasks for Deepening the Reform of Medical and Health System in 2014</td>
<td>Focus on actions aimed at addressing vulnerabilities in policies and support in terms of market access and business environment for private medical institutions, with a detailed time schedule for it</td>
</tr>
<tr>
<td>Mar, 2015</td>
<td>General Office of the State Council</td>
<td>National Medical and Health System Planning Outlines (2015-2020)</td>
<td>Support the inclusion of private medical institutions in the scope of the pilot medical insurance program and provide them with major medical equipment; encourage government procurement of services provided by private medical institutions; support private medical institutions to enhance key departments, recruit and develop talents, improve academic status, accelerate the networking of IT systems with those of medical insurance service providers and public medical organizations</td>
</tr>
<tr>
<td>May, 2015</td>
<td>General Office of the State Council</td>
<td>State Council General Office's Directive关于Reforms of Urban Public Hospitals</td>
<td>Maintain adequate control over the number, distribution and industrial structure of public hospitals; encourage the restructuring of some of the tier-II hospitals in cities into community medical service providers, special hospitals, nursing houses and recovery institutions through different means, including relocation, integration and transformation; encourage private investors to invest in medical facilities through a number of different means, e.g., establishing new hospitals or participating in the restructuring of existing ones; particularly, support the establishment of not-for-profit medical institutions; implement pilot reform programs for the introduction of private investment in public hospitals in cities with abundant public hospital resources</td>
</tr>
<tr>
<td>June, 2015</td>
<td>General Office of the State Council</td>
<td>State Council’s Policies and Measures regarding Non-public Medical Institutions</td>
<td>Continue to ease market access restrictions; expand investment and financing channels; promote the activation and sharing of medical resources; improve business environment for private medical institutions; incorporate qualified private medical institutions in the scope of the pilot medical insurance program, so that they may be entitled to the same policies available to public medical organizations; explore different models for the establishment and operation of private regional examination or test centers for all medical organizations, e.g., joint investment and private operation, or private investment with support from public organizations</td>
</tr>
<tr>
<td>Sep, 2015</td>
<td>General Office of the State Council</td>
<td>State Council’s Directive about Promoting the Building of A Grading Diagnosis and Treatment System</td>
<td>Encourage private investment in medical institutions; simplify quality approval procedures for individual medical practitioners; encourage qualified medical practitioners to open clinics to serve local residents</td>
</tr>
<tr>
<td>Nov, 2015</td>
<td>General Office of the State Council</td>
<td>State Council’s Directive about Accelerating the Development of the Life Service Industry and Promoting the Upgrading of Consumption Structure</td>
<td>Take actions to improve the quality of medical service; optimize the allocation of medical resources; eliminate unreasonable restrictions for private investment in medical institutions; accelerate the shaping of a diversified medical landscape</td>
</tr>
<tr>
<td>Mar, 2016</td>
<td>National Development and Reform Commission</td>
<td>Opinions on Key Actions for Deepening Economic System Reform in 2016</td>
<td>Encourage financial institutions to develop innovative products and services; explore innovative ways to provide financial support to private investment in medical institutions</td>
</tr>
<tr>
<td>Apr, 2016</td>
<td>General Office of the State Council</td>
<td>Key Tasks in Deepening the Medical and Health System Reforms in 2016</td>
<td>Ensure the implementation of the private medical investment policies; conduct special inspection on the implementation of General Office of the State Council Notice on the Distribution of Policy Actions on Promoting Private Investment in Medical Institutions and Accelerating the Development of the Initiative (lead by National Development and Reform Commission and National Health and Family Planning Commission, with the participation of Ministry of Commerce and State Administration of Traditional Chinese Medicine)</td>
</tr>
</tbody>
</table>
Encouragement to the development of rehabilitation therapy

**Medical insurance**

According to the Notice on Basic Medical Insurance's Coverage of Some New Medical Rehabilitation Items issued jointly by the Ministry of Human Resources and Social Security, National Health and Family Planning Commission, Ministry of Civil Affairs, Ministry of Finance and China Disabled Persons’ Federation on September 3, 2016, 20 rehabilitation items including “comprehensive rehabilitation evaluation” should be covered by the medicare payment system in all areas before June 30, and the 9 medical rehabilitation items which have been covered should be retained. This increase in medical insurance reimbursement items will further reduce the cost burden on patients needing rehabilitation.

**Multi-sited License**

Notice on Relevant Issues concerning Doctor's Multi-sited License was issued by the former Ministry of Health in 2009 and pilot projects were carried out in some areas. In 2011, the former Ministry of Health issued Ministry of Health General Office's Notice on Expanding the Scope of Pilot Projects of Doctor's Multi-sited License, encouraging medical personnel to work in grass-roots units and rural areas. Opinions about Doctor's Multi-sited License (Exposure Draft) was issued on January 26, 2014. On January 12, 2015, Notice on Promoting the Implementation of Opinions about Doctor's Multi-sited License was issued by the National Health and Family Planning Commission, National Development and Reform Commission, Ministry of Human Resources and Social Security, State Administration of Traditional Chinese Medicine and China Insurance Regulatory Commission.

The publishment of relevant opinions and notices demonstrates that the Ministry of Health encourage and support doctor's multi-sited license. The operation of rehabilitation hospitals mainly depends on the number of general practitioners, rehabilitation therapists and other related personnel, and does not need too many clinicians in departments upstream of rehabilitation hospitals. Therefore, rehabilitation hospitals can go with the tide of multi-sited license and engage clinicians from public hospitals as their part-time doctors. Rehabilitation hospitals save staff expenses while taking the needs of hospital operation into consideration.
**Why invest in rehabilitation therapy**

With a short development history in China, currently rehabilitation medicine has a poor recognizability and acceptability to patients and the number of people actually receiving rehabilitation is far lower than that of postoperative patients who should receive rehabilitation in China. According to statistical yearbook data of the National Health and Family Planning Commission of PRC, inpatients receiving rehabilitation therapy in the rehabilitation department in China reached 1.57 million person-times in 2014, including those who have been admitted to and discharged from hospital for many times, and the number of inpatients who actually received rehabilitation therapy was lower than 1.57 million. In China, there are 138 million old people, among whom up to 70 million are in need of rehabilitation. The huge difference in number between patients actually admitted to hospital and those with potential demand not only indicates that patients attach no importance to rehabilitation therapy, but implies that there is a potentially tremendous rehabilitation market. As people hold a positive attitude toward rehabilitation therapy and show enhanced awareness of rehabilitation, and there are increased reimbursements related to rehabilitation treatment items available from the medical insurance system, more and more patients with potential needs for rehabilitation therapy begin to receive such therapy, and there will be far more inpatients than those acceptable to the current rehabilitation service supply.

In recent years, China has gradually lifted the restrictions on and encouraged running medical institutions with social capital. Different forces invested in the medical field one after another, preferring stomatology, ophthalmology, gynaecology and obstetrics and other specialized hospitals. And rehabilitation hospitals have gradually become a region attractive to investors due to their high standard level and profitability and short profit cycle. According to the report of Industrial Securities Institute, specialist rehabilitation hospitals followed ophthalmology, cosmetology and stomatology and ranked 4th in terms of net profit rate. Taking Hunan Xiangya Boai Rehabilitation Hospital as an example, it was formally put into operation in 2012, broke even in 2014 with an income of 100 million Yuan, and its anticipated revenue and net margin for 2015 were 150 million and about 16 million Yuan, respectively (net profit rate 10%).

**Main investment modes regarding rehabilitation hospitals**

At present, main investors in rehabilitation hospitals are pharmaceutical enterprises, medical device companies, insurers, and institutional investors (See Table 2: Cases of private capital investment in rehabilitation institutions for details). Rehabilitation equipment and drug manufacturers in the upstream section of the rehabilitation industry have begin to expand their business downstream and explore rehabilitation hospitals (e.g. the newly-built Hokai Rehabilitation Hospital invested by Hokai Medical Instruments); insurers with abundant financial resources chose to invest in retirement communities characterized by the combination of medical treatment and recuperation (e.g. the newly-built Taikang Yanyuan Rehabilitation Hospital invested by Taikang Life Insurance); and there are some institutional investors who have been investing in the medical field for a long time, e.g. Sequoia Capital which invested in PKUCare Rehabilitation Hospital.

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The patterns of investment in rehabilitation medicine with social capital include building new hospitals, purchasing hospitals and mandating hospitals. Many investors would like to build a rehabilitation hospital together with public hospitals to make the best of hospitals’ medical and patient resources; and this can also solve the financing problem of public hospitals.
Rehabilitation hospitals are demanding in terms of testing based on cost-benefit estimation. Second, their own financial endurance strength, and carry out stress not very optimistic profitability. So investors should consider costs and small and unstable patient resources resulting in easy to copy the success of Hunan Xiangya Boai hospitals and prepare for long-term investment. It is not rationally evaluate the profitability of rehabilitation spot, it is not advisable to follow suit. First, investors should pay attention to

Table 2: Cases of private capital investment in rehabilitation institutions

<table>
<thead>
<tr>
<th>Rehabilitation hospitals</th>
<th>Investors</th>
<th>Investment pattern</th>
<th>Brief introduction to hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xiangya Boai Rehabilitation Hospital</td>
<td>Tasly Holding Group/Hunan Fazhan</td>
<td>Newly built via investment + public hospital under trusteeship</td>
<td>Xiangya Boai Rehabilitation Hospital has 400 rehabilitation beds, a rehabilitation area up to 10 thousand square meters, and 150 rehabilitation therapists</td>
</tr>
<tr>
<td>Beijing United Family Rehabilitation Hospital</td>
<td>Fosun Pharma, Chindex Medical Limited</td>
<td>Newly built via investment</td>
<td>Providing neuro-rehabilitation, orthopaedic rehabilitation, cardiac rehabilitation, pregnancy and postpartum rehabilitation, children’s rehabilitation, physical therapy, occupational therapy, speech therapy, cognitive rehabilitation, prosthetics and orthotics, acupuncturer, hydrotherapy, high pressure oxygen and TCM services</td>
</tr>
<tr>
<td>PKUCare Rehabilitation Hospital</td>
<td>Founder Group, PKUCare and Sequoia Capital</td>
<td>Newly built via investment</td>
<td>Total area 30,000 m2, 4,000 m2 of rehabilitation training zone, 300 beds. Equipped with rehabilitation robots for adults and children, hyperbaric oxygen chambers, comprehensive rehabilitation evaluation device, etc. The rehabilitation team will be led by renowned experts at home and abroad, providing patients with neurologic damage, cerebrovascular disease, spinal injury, bone fracture, pediatric cerebral palsy, and pain in muscle and joints with scientific and comprehensive rehabilitation services</td>
</tr>
<tr>
<td>Beijing Intech Rehabilitation Hospital</td>
<td>Capital Healthcare Group</td>
<td>Newly built via investment</td>
<td>15,000 m2, about 200 beds, with internal medicine, surgical, TCM, and rehabilitation departments, introducing advanced rehabilitation and nursing equipment, beeper, central oxygen supply system, electric nursing beds and suspension-lift transfer machine from Sweden</td>
</tr>
<tr>
<td>Shijingshan Branch</td>
<td>Taikang Life Insurance</td>
<td>Newly built via investment</td>
<td>A secondary rehabilitation and geriatric hospital 10,000 m2, with two standard operation rooms and 114 beds, providing old people in the community and surrounding residents with prevention, treatment, rehabilitation and long-term nursing services as well as services of chronic disease management and hospice care</td>
</tr>
<tr>
<td>Taikang Yanyuan Rehabilitation Hospital</td>
<td>Taikang Life Insurance</td>
<td>Newly built via investment</td>
<td>A specialist rehabilitation hospitals built jointly by Taikang Life Insurance Co., Ltd., Zhengzhou People’s Hospital Medical Group and University of Utah with a floor area of 6,000 m2, focusing on neuro-rehabilitation and orthopedic rehabilitation</td>
</tr>
<tr>
<td>Hokai Rehabilitation Hospital</td>
<td>Hokai Medical Instruments</td>
<td>Newly built via investment</td>
<td>Purchased Rhine Hospital at a price about 42.4821 million Yuan; Rhine Hospital focusing on medical rehabilitation and nursing, with abundant rehabilitation experience in orthopedics, internal medicine, sports injury, cardiovascular and cerebrovascular diseases and venous disorders</td>
</tr>
<tr>
<td>Rhine</td>
<td>Huapont Life</td>
<td>Purchasing 100%</td>
<td>Possessing rehabilitation medicine, internal medicine (respiratory medicine, neurology, cardiovascular medicine, and geriatrics), surgical (neurosurgery, orthopedics), paediatrics (pediatric neurology), children healthcare, TCM (internal medicine), psychiatry (clinical psychology), pain and critical care medicine departments, and 104 beds</td>
</tr>
<tr>
<td>Kunming Changhe Tiansheng Rehabilitation Hospital</td>
<td>LIH Investment &amp; Management</td>
<td>Newly built via investment</td>
<td>Providing neuro-rehabilitation, orthopaedic rehabilitation, cardiac rehabilitation, pregnancy and postpartum rehabilitation, children’s rehabilitation, physical therapy, occupational therapy, speech therapy, cognitive rehabilitation, prosthetics and orthotics, acupuncturer, hydrotherapy, high pressure oxygen and TCM services</td>
</tr>
<tr>
<td>Luye Bobath Rehabilitation Hospital</td>
<td>Luye Group</td>
<td>Newly built via investment</td>
<td>A high-end brain rehabilitation hospital built jointly by Luye Medical and Bobath Memorial Hospital in South Korea, focusing on cranial nerve diseases (stroke, traumatic brain injury, etc.) and degenerative cranial nerve diseases (Alzheimer’s disease and Parkinson’s disease) rehabilitation services</td>
</tr>
<tr>
<td>Yada International Rehabilitation Hospital</td>
<td>Yada International Holdings Ltd</td>
<td>Newly built via investment</td>
<td>Integrating recuperation, living, medical treatment, food and beverage, and entertainment, providing healthy, non-self-care and half self-care old people and people with special needs for medical care with one-stop service patterns, including short- and long-term services and a variety of customized care services. Providing patients with nerve system disorders (such as stroke, postoperative stage of cerebral trauma, peripheral nerve injury) and sub-health population with professional rehabilitation services; combination of medical treatment and recuperation</td>
</tr>
</tbody>
</table>

Key issues investors should pay attention to

Although the investment in rehabilitation is the current hot spot, it is not advisable to follow suit. First, investors should conduct full investigation into the incidence, relation between supply and demand, population and economy of the area where the proposed hospital is built and develop scientific and rational strategic planning. Moreover, the quality of the management team and the medical team should be valued when investing in rehabilitation hospitals. The management team is essential since it controls the general orientation of hospital operations. How to achieve efficient performance by using modern management mechanism is an issue worth thinking about. On the other hand, a high-quality medical team is the core value of a hospital. The crux of the matter is how to attract and train excellent medical and healthcare personnel and build a team of echelon personnel.
We are highly recognised in healthcare, pharmaceuticals and life sciences industries globally

2016

MarketScape leader, IDC
Worldwide Life Science R&D Strategic Consulting Services
Vanguard leader, ALM (formerly Kennedy)
Digital Healthcare Consulting: Payers, Providers, and New Market Entrants

2015

MarketScape leader, IDC
Life Science Manufacturing and Supply Chain Strategic Consulting
Life Science Sales and Marketing Strategic Consulting
Vanguard leader, ALM
Consulting to Public and Private Healthcare: Cybersecurity

Vanguard leader, Kennedy
Consulting to Healthcare Payers & Providers: Digital Information for Alternative Care Models (ACM)
Consulting to Healthcare Payers and Providers: Alternative Care Models (ACM)
Life Sciences Supply Chain, Operations and Talent
Life Sciences Supply Chain Technology Enabled and Digital Initiatives
Consulting to Private Healthcare Payers & Providers: Customer Engagement
Healthcare JVs, Partnerships and Collaborations

2014

Vanguard leader, Kennedy
Life Sciences: Key Technology Initiatives
#1, KLAS
Financial ERP Implementation Services Category Leader