

ANNEX 3 – Examples of HCA Innovations

<i>HCA wide innovations</i>	
Extremity MRI	HCA developed a scan which uses a strong magnetic field and radio waves to create high quality computer images of tissues, organs and structures inside the body.
Digital mammography	HCA was the first provider to implement digital mammography. This delivers rapid, high resolution digital images which can be manipulated and enhanced to ensure the clearest quality image is produced to support breast cancer detection. It also enables remote review of images.
Quantra breast density reader	HCA provides a computed breast density figure for all women having a mammogram, enabling identification of the heightened risk and increased difficulty of detection associated with high breast density.
Prostate mapping with a 3T MRI	In 2012 HCA was the first private hospital to participate in prostate scanning with a powerful MRI machine (3T vs. 1.5T), providing a non-invasive way to assess prostate cancer.
Provenge	HCA was the first provider to implement the use of Provenge, which is a new immunotherapy for prostate cancer.
SuperDimension	HCA developed an electromagnetic navigation which guides bronchoscopy to the relevant area, providing minimal invasive access to lesions deep in the lungs as well as mediastinal lymph nodes.
Fiducial markers	HCA developed markers to be placed on / in the patient's body to help guide radiotherapy treatment to the target regions, increasing accuracy and reducing exposure to non-target regions.
Video-Assisted Thoracic Surgery (VATS)	HCA developed surgery using small cameras providing a live feed from within the patient's body, enabling the surgeon to take a less invasive approach.
Virtual colonoscopy	HCA developed an imaging technique, used as an alternative to full colonoscopy, which has a lower risk and is less invasive than a full colonoscopy. The patient's colon is inflated and imaged using a CT scanner. Computers are then used to construct a representation of the patient's colon for inspection.
ICU IT system	HCA developed a system to support the workforce in monitoring the vital signs of ICU patients and making personnel aware of any unexpected changes.
Physician and patient portals	HCA developed a technology to allow physicians to securely access patient records remotely, to keep abreast of patient's progress when not on site.

<i>HCA wide innovations (cont.)</i>	
Provision of centralised laboratories	HCA developed a broad range of high specification laboratories, offering market-leading turnaround times and test accuracy.
HCA Cancer Networks	HCA's Cancer network acts to coordinate the delivery of cancer care across the organisation ensuring seamless care provision between facilities whilst setting and monitoring key quality and outcome measures. It is the first Cancer Network to be accredited by CHKS. Cancer requires a complex treatment pathway involving diagnostics, surgery, chemotherapy, radiotherapy, supportive and palliative care. The complex nature of the disease and its treatment means the best results are obtained by highly integrated clinical teams.

Harley Street Clinic (HSC) innovations	
CyberKnife	In 2007 HSC opened the UK's first revolutionary CyberKnife robotic radiosurgery machine. This is a compact linear accelerator mounted onto a robotic arm designed to deliver precision treatment of tumours anywhere in the body, including areas not possible to treat on more established radiotherapy.
Gamma Knife	In 2005 HSC introduced an advanced radiosurgical system which is used to treat patients with certain brain conditions. This technique was first introduced by the Bupa Cromwell hospital in London, and developed by HCA in response to Bupa as a competitor. It may be used as a replacement for conventional neurosurgery, or it may be effective in situations where there is no conventional surgical alternative available. The London Gamma Knife Centre at Barts is the first time that the private sector and the NHS have partnered to offer this important radiosurgical treatment to patients from all sectors.
Image Modulated Radiotherapy (IMRT), Image Guided Radiotherapy (IGRT) and Rapid Arc	HSC developed radiotherapy systems which, using a tumour mapping system, target tumours with a greater degree of accuracy and far less damage to surrounding healthy tissue than linear accelerators without these systems. HSC's figures are well in excess of the national figures. HSC uses a technique called RapidArc to deliver IMRT to the patient.
Watchman device	HSC developed a minimally invasive technique, which was the first in the private sector, involving the insertion of a Left Atrial Appendage Closure Device in patients with AF. This device filters any blood clots which may form as a result of disturbed blood flow in the left atrium, reducing the risk of stroke.
Renal denervation	HSC developed a minimally invasive technique involving the ablation of renal blood vessels to treat refractory hypertension.
GUCH service	HSC set up this service in February 2011 which links in with the Somerville Association. The service works with its Paediatric Cardiac Service and cares for cardiac patients from the age of 16.
Paediatric cardiac	HSC were one of the first private healthcare facilities to offer cardiac surgery to children from birth. It currently sees its patients return in their adult years and is now developing a 'grown up' congenital heart service to accommodate these patients. The service also links in with our GUCH service once the patients reach 16 years of age.
Calypso	HSC have Calypso tracking (http://www.calypsomedical.com). This involves implanting marker beacons into the prostate gland so that any movement can be tracked during treatment. The prostate can move according to bladder and/or rectal fullness, bowel gas, bowel motion. This technique allows radiotherapists to track the prostate movement and terminate the beam if the prostate moves out of the radiation beam. This allows HSC to treat smaller volumes, reducing side effects for patients.

Harley Street Clinic (HSC) innovations (cont.)	
Paediatric BMT	In February 2013 HSC opened the first and only unit in the private sector providing haematology specialist care in addition to the BMT care.
Deep Inspiration Breath Hold Radiotherapy	HSC have developed a technique where RT treatment is given when the patient breathes in and holds their breath. The action of breathing in moves the breast away from the heart and reduces the radiation dose. This reduces the risks to the patient of heart damage and late complications. This is not widely carried out in the UK. Since introducing the technique in 2011, it has treated over 100 patients, and the technique is being requested by doctors more frequently.
Paediatric Intensive Care Unit (PICU)	HSC has the largest private PICU in Europe. In 2010 HSC's PICU became the first private unit participate in data collection for PicaNet (Paediatric Intensive Care Audit Network). The data is used to identify best practice, monitor supply and demand and review treatment outcomes. PicaNet also study the epidemiology of critical illness in children.

London Bridge Hospital (LBH) innovations	
Super low-dose CT	In 2012 LBH offered a super low-dose CT scanner, an imaging system that drastically reduces the radiation dose to patients and is especially beneficial to patients who may require multiple imaging tests, such as cancer patients.
Private EBUS	LBH was the first to introduce endo-bronchial ultrasound technology used to identify and sample suspected cancers.
Hybrid cath labs	LBH developed TAVI procedures to be conducted in a cath lab setting.
Live related liver transplants	At the London Liver Centre, LBH offer living donor liver transplantation for patients who have no access or entitlement to cadaveric organs or to those patients for whom liver resection or chemotherapy is not an option.
Live related renal transplants	LBH was the first private facility to offer kidney transplant from a live donor.
Renal Displays unit	LBH was the first private facility to offer dialysis which delivers care to both private and NHS patients.
TAVI 27	LBH was the first private facility to offer TAVI (Transcatheter Aortic Valve Implantation), closely followed by the Harley Street Clinic.
Lupus centre	LBH provided the first specialist lupus centre in the private sector.
Cardiothoracic data	LBH was the first and only private hospital to publish cardiothoracic data allowing HCA to be compared to the NHS and overseas providers.
Hansen Robot™	LBH was the first private hospital to use the Hansen Robot for ablation. Robotic ablation is catheter ablation of cardiac arrhythmias performed by an electrophysiologist using a robotic system. The robotic system consists of a robotic sheath that manipulates cardiac catheters, operated remotely at a nearby control station.
Dual ablation procedure for Arrhythmia	LBH performed the world's first dual ablation Arrhythmia procedure. It is the first time this new dual procedure has been performed worldwide. It involves a normal radio frequency ablation operation combined with the cryo ablation procedure which increases the effectiveness of the treatment.
Hybrid cardiovascular laboratory	LBH developed the first hybrid cardiovascular laboratory in the private sector. The hybrid lab is a facility which combines the powerful imaging equipment of the angiography suite with the specific environment of the operating theatre.
Blood conserving and recycling	LBH was the first private hospital in the UK to routinely use cell salvage (collection, processing and returning a patient's own blood) during all surgical procedures where bleeding is a risk. This has led to a significant reduction in transfusions.
Anti-Platelet Therapy program	LBH were the first (and still only) private hospital to offer an Individualised Anti-Platelet Therapy program using a Multiplate Platelet Function Analyser. All cardiology and cardiac surgical patients on Aspirin, Clopidogrel, Prasugrel or Ticagrelor are assessed to ensure the drugs are working effectively.

London Bridge Hospital (LBH) innovations (cont.)	
Spartan Rx	LBH was the first hospital in the world to use the Spartan Rx (Point of Care) DNA analyser for Individualised Anti-Platelet Therapy.
Vivostat Autologous Fibrin Sealant	LBH was the first private hospital in the UK to use the Vivostat Autologous Fibrin Sealant (tissue 'glue' prepared from a sample of patient blood at the time of surgery) to prevent bleeding during surgery. This forms part of LBH's Total Blood Management program along with its coagulation laboratory and cell salvage procedure.
Theatre based Coagulation and Haematology laboratory	LBH has the most comprehensive theatre based Coagulation and Haematology laboratory to diagnose clotting abnormalities and prevent bleeding and transfusions.
Bio-coated heart lung machine circuit and centrifugal blood pump technology	LBH is the only private hospital to routinely use a bio-coated heart lung machine circuit and centrifugal blood pump technology to limit blood trauma during cardiac surgery.
PLAC (LpPLA2) test	LBH was the first hospital in the UK to offer the PLAC (LpPLA2) test to assess an individual patient's risk of stroke or heart attack.
Accredited as a training unit for Perfusionists	LBH is the only Perfusion Department in the UK private sector accredited as a training unit for Perfusionists by the College of Clinical Perfusion Scientists of Great Britain and Ireland.
POTs Clinics	LBH provided the first clinics in the UK private sector for syncope Clinic-Postural Orthostatic Tachycardia (POTs) patients.
EBUS Lung Cancer Diagnosis	LBH developed Endobronchial Ultrasound (EBUS) which is a minimally invasive approach to sampling lymph nodes which are difficult to access or central masses in the chest. Lymph nodes as small as 5 mm can be sampled and the technique has broader applications. These include the diagnosis and staging of cancers of the lung and other cancers that are suspected of spreading to the lymph nodes in the chest.
Disordered Breathing Clinic	LBH was the first private clinic dedicated to the treatment of breathing disorders.
Intra-operative MRI for spinal	LBH developed intraoperative magnetic resonance imaging (iMRI). This is an operating theatre configuration where surgeons can image the patient via an MRI scanner while the patient is undergoing surgery. Although commonly used for brain procedures, LBH pioneered the use of intraoperative MRI for spinal procedures.

<i>London Oncology Clinic (LOC) innovations</i>	
Survivorship programme	LOC developed the first private survivorship programme.
Integrated electronic notes	LOC developed integrated electronic notes allowing access to the patient's notes from their entire cancer pathway, accessible anywhere via a secure portal.
Protocol driven electronic prescribing	LOC developed world leading use of protocol driving software that means doctors cannot deviate from accepted best practice behaviour in the administration of chemotherapy.
Audit and outcome analysis (Mosaic)	LOC developed an entirely auditable electronic record which allows for visibility of abnormal doctor behaviour - alerting lead doctors to deviations from the norm, and therefore intervention.

<i>NHS Ventures (NHSV) innovations</i>	
Bone marrow transplants	NHSV were the first private facility to offer bone marrow transplants.
TIL	NHSV developed a clinical team to deliver the specialist care that is involved in the complex “TIL Therapy” process. This process involves chemotherapy; cells grown in the laboratory and interleukin-2.

Princess Grace (PG) innovations	
NanoKnife	In 2012 PG developed a pioneering new cancer treatment for inoperable tumours in the lungs, kidney, liver, breast, prostate or pancreas.
da Vinci robotic surgery	In 2012 a computer-enhanced robotic surgery system was first brought to the UK at the Princess Grace which enables a surgeon to perform minimally invasive work in tricky or delicate areas whilst having a clearer 3D view of the nerves, blood vessels and muscles. This led to the first liver re-section and Whipples and the first single access cholecystectomy in the UK.
Breast intra operative radiation therapy (IORT)	From October 2012, the PG became the first private hospital in the UK to offer IORT, a pioneering form of radiotherapy that can be delivered in a single session, rather than over several weeks.
Vacuum assisted breast biopsy	In 2006 PG developed a technique which allowed for the removal of breast lumps quickly and without a surgical operation, using the technology of the ENCOR breast biopsy system.
Focal therapy including HIFU and RFA	In 2005 PG developed less invasive treatment options for prostate cancer, using High Intensity Focused Ultrasound (HIFU) or Radio-Frequency Ablation (RFA) to destroy tumours. This was the first of its kind.
Modic antibiotic spinal therapy	In 2013 PG were first in the UK to carry out Modic antibiotic spinal therapy, which involves interpretation of MRIs at different modalities.
Schrill in endoscopic spinal surgery	In 2013 PG were first in the UK to use the schrill in endoscopic spinal surgery.
Complex MRI	In 2013 PG was the first private centre to develop complex MRI programs to look at the diffusion of nutrients into the inter-spinal disc.
Trimano	In 2013 PG was the first private hospital in the UK to use this position guided extension, replacing the surgical assistant for shoulder surgery.
SmartPil	In 2010 PG was the first in Europe to offer an ingestible capsule that measures PH, pressure and temperature through a wireless connection monitor.
Surgiquest	In 2013 PG was the first private hospital in UK to use a laparoscopic port that maintains an air tight pneumothorax, improving visual field.
Balloom kyphoplasty	In 2007 PG was the first private hospital to offer this procedure.
Endoscopic spinal surgery	PG developed Endoscopic spinal surgery in 2012 which enables patients to have a reduced recovery period.

Princess Grace (PG) innovations (cont.)	
IORT	In 2012 PG developed Intra-operative radiotherapy. This allows the patient to have radiotherapy at the time of surgery, negating the need for numerous visits over the course of treatment.
Robotic surgery	In 2012 PG developed robotic surgery (prostate, kidney, HPB, colorectal and gynae) – within its planned Robotic Centre of Excellence. Robotic work allows for some surgeries to take place that would otherwise be inoperable (HPB in particular).
HiFu	In 2005 PG developed high frequency ablation (Hi Fu) for prostate cancer.
Urgent Care Centre	In 2005 PG introduced a care centre, helping to reduce NHS A&E pressures and providing a wide range of specialty cover.
London Breast Institute	Introduced by PG in 2008 to give patients access to specialist services from leading physicians. The institute publishes and contributes to a great deal of international research.
ISEH	Introduced in 2013 by PG to provide access to top consultants for elite and weekend warrior sportsmen. It is a unique partnership between NHS, BOA, ISEH & HCA. It assists the NHS and contributes to research.
24 hour on site ICU consultant cover	Developed by PG in 2008 to increase patient safety.
Consultant responsible for pre-admission services	Developed by PG in 2011 to increase efficiency and ensure correct treatment of patients.
Dedicated self-pay team	Developed by PG in 2013 to assist patients and allay their concerns.
Patient ID card	Developed by PG in 2013. Patients are given a card with a unique number used across the hospital. This eliminates duplicate registration and possible issues with care/treatment.
Metal on metal hip replacement trial	Developed by PG in 2013, this trial looks at degradation of metal on metal hip replacements. It operates across multiple sites including London Bridge.

Portland Hospital (PH) innovations	
Accumulation and investment in sub specialised and hard to recruit staff – CNS, PICU nurses etc, Technology investment	PH currently has the largest and most comprehensive private paediatric service in the UK.
Resident obstetric anaesthetist	Introduced by PH to enhance safety for the patient. PH was the first hospital in the country to do so.
Offers the only private neonatal unit in the UK	In 1983 PH developed a 7 bed neonatal unit staffed by consultant neonatologists.
Private maternity unit	In 1983 PH developed the only full private maternity unit which has approx 2000 deliveries per annum.
Private Food allergy and challenge services	Introduced by PH in 2013, it is the only facility to offer a full allergy service provision.
Cochlear implant program	In 1997 PH developed a full paediatric and adult cochlear implant program.
Neurosurgery/ craniofacial surgical groups	In 2011 PH developed a comprehensive neurosurgical and craniofacial service.
Paediatric Intensive Care Unit	In Nov 2011 PH developed a 10 bed PICU.
Private paediatric acute neuro-rehabilitation unit	In 2009 PH developed a 9 bed unit, becoming the only private paediatric acute neuro-rehabilitation unit in the UK.
Comprehensive multidisciplinary private birth mark service	In 2011 PH developed the only comprehensive multidisciplinary private birth mark service involving dermatologists, interventional radiologists and plastic surgeons.
24/7 access to private paediatrician for urgent admissions	Introduced by PH in 2010 and includes both outpatient access and onward admission to hospital if required.
State of art ct scanner for children	PH developed anaesthetised and non-anaesthetised scans in November 2012.

SCRI innovations	
Genetic profiling laboratory	Developed by SCRI in 2013 this new laboratory provides the opportunity for molecular profiling of a patient's tumours to become a routine part of the diagnosis of their cancer. It ensures that doctors can identify different treatments based on the genetic make-up of the tumour and what drugs it is likely to respond to.
In-man clinical trials for privately funded patients	Developed in 2010 SCRI is the only private facility in the UK to run first-in-man clinical trials. It is part of a much larger US infrastructure.

Wellington Hospital (WH) innovations	
Neurorehab unit	Developed in 2006, WH was the first private hospital to introduce a dedicated neurorehabilitation facility.
Neuro rehab robots	WH was the first private hospital to introduce neurorehabilitation robots.
Medical admissions unit	WH was the first private facility to be able to urgently admit patients with considerable complications such as ventricular failure, pneumonia and COPD. These would not otherwise be able to be admitted privately.
Neuro endocrine service for complex tumours	WH was the first hospital in the private sector to develop a Neuro endocrine service for the treatment of complex tumour. The first, overall, was the Royal Free Hospital, where the service was developed. Cases also come from the US where they are not allowed to use complex compounds.
Closure of hole in the heart using minimal invasive procedure	WH developed a procedure involving closure of a hole in the heart. It is a minimal invasive procedure employing memory metal devices. Hole in the heart repairs previously needed major open heart surgery, three months off work, were high cost and involved risky anaesthetics. London Bridge and the Wellington were the first hospitals in the UK private sector to introduce this procedure which takes an hour and the patient goes home the same day.
Complex EP ablations	WH developed complex EP ablations done in the cath lab. All three cardiac sites perform more complex work than available from the NHS.
Acute stroke unit costing	WH is soon to begin building the first UK private sector acute stroke unit at a cost of [£]. There is no other operator currently offering this type of service.
Counter pulsation treatments	WH developed counter pulsation treatments for end stage cardiac failure. The nearest centre is in the US, with WH the first and currently the only centre in the UK.
Stem cells to grow ligament tissue	WH were the first in the UK private sector to use stem cells for the growth of ligament tissue in orthopaedic joint and tissue repair.