

Using Modern Technology in Cancer Patient Treatment at Bai Chay Hospital, Quang Ninh

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Abstract

At the Department of Functional Exploration (Bai Chay Hospital), the doctors and nurses have mastered the modern endoscopic ultrasound technique, which provides fast and accurate diagnosis of diseases of the digestive tract, gallbladder, pancreas, mucosal and extra-mucosal lesions of the gastrointestinal tract. Regularly invite leading experts in specialized fields to help the province both directly examine and treat people and train staff. As a result, provincial hospitals have implemented many new and high-tech techniques, successfully treating many severe and difficult diseases without having to transfer patients to higher levels, creating favorable conditions and reducing costs for patients. Our study shows that Bai Chay Hospital has continuously deployed and applied modern and specialized medical techniques and technologies in the fields of general surgery, cranial nerves, spine, oncology, etc., for effective treatment of pathologies.

Keywords: Bai Chay Hospital, Cancer Patient, Modern Scientific Technology, Smart Medical.

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INTRODUCTION

Bai Chay Hospital in Quang Ninh province has been a pioneer in applying technology in medical services. Hospitals increase IT application, move towards paperless hospitals, and at the same time improve operating capacity and modernize by which has brought great achievements in professional work, especially in prevention and examination and treatment.

Hence we research on this topic “Using Modern technology in Cancer Patient Treatment at Bai chay Hospital, Quang Ninh”.

Table 1- Summary of previous studies

Authors	Year	Content, results
DTN Huy	2015	Risk management issued needed to discuss, confirmed by (TTB Hang et al, 2020; TTH Ha et al, 2019).
Charmsaz et al	2018	Conventional therapies for cancer such as chemotherapy and radiotherapy remain a mainstay in treatment, but in many cases a targeted approach is lacking, and patients can be vulnerable to drug resistance. In recent years, novel concepts have been emerging to improve the traditional therapeutic options in cancers with poor survival outcomes. New therapeutic strategies involving areas like energy metabolism and extracellular vesicles along with advances in immunotherapy and nanotechnology are driving the next generation of cancer treatments. The development of fields such as theranostics in nanomedicine is also opening new doors for targeted drug delivery and nano-imaging. Here we discuss the use of innovative technologies presented at the Irish Association for Cancer Research (IACR) Annual Meeting, highlighting examples of where new approaches may lead to promising new treatment options for a range of cancer types
Maas et al	2016	The ability to isolate, characterise, and functionally phenotype nanometer-scale extracellular vesicles is opening up new possibilities for the therapeutic and diagnostic use of these intercellular RNA, DNA, and protein carriers.
Shi et al	2017	Nanomedicine is harnessing the power of nanotechnology to improve drug delivery, pharmaceutical properties, imaging, and diagnosis, establishing the area of theranostics.
Ahlbrandt et al	2020	deal with gathering and analyzing genomic information, where cloud computing, uncertainties and reproducibility challenge researchers. Also, new sources for additional phenotypical data are shown in patient-reported outcome and machine learning in imaging. Last, they focus on therapy assistance, introducing tools used in molecular tumor boards and techniques for computer-assisted surgery. They conclude with an outlook towards a learning health care system in oncology, which connects bench and bedside by employing modern IT solutions.
HT Hanh et al	2020	FDI investment in such fields accounted
Vu Thanh	2021	We can offer patients with treatment solutions at home.

Research questions:

Question 1: Analyzing previous related studies?

Question 2: What are technology applications in medical treatment solution for cancer patients?

Next we analyze related studies in below table:

Then, DTN Huy (2012) paid attention to risk management in such activities and confirmed by (PM Dat et al, 2020; TTH Ha et al, 2019). And Le, K., & Nguyen, M (2020) says it shown meanings in education. While NTT Phuong, DTN Huy, PV Tuan (2020) said banks should involve, this confirmed by (DTN Huy et al, 2021; Hac LD et al, 2021; DTN Huy & NT Hang, 2021).

SUBJECT AND METHODOLOGY

- Study Design: A cross-sectional descriptive study.
- Research subjects: Patients diagnosed with liver cancer are being treated at Cancer Center – Bai Chay Hospital - Quang Ninh province.
- Research period: from June 2019 to May 2020.

Data will be from real cases of Vietnam hospitals such as Bai Chay hospital in Quang Ninh, from their achievements over years in cancer treatment and recent investments, and method will be mainly qualitative analysis and inductive, explanatory and synthesis method used.

RESEARCH RESULTS

1. Cancer patient treatment

Up to now, Patients with cancer may seek a variety of treatment options, including systemic therapy (chemotherapy, targeted therapy or immunotherapy, etc.), radiation therapy, and surgery. As for chemotherapy, this is a method of killing cancer cells with the use of one or more anti-cancer drugs. This therapy can be used in combination with other cancer treatments to achieve the best results. Chemotherapy has the potential to help patients cure or reduce cancer, improve quality of life and prolong life.

In chemotherapy, anti-cancer drugs are used to destroy the rapidly growing and dividing malignant cells in the patient's body. However, due to the limitation of this therapy is the simultaneous effect on both cancer cells and healthy cells throughout the body, so it can bring many unwanted side effects to the patient.

Usually, chemotherapy in cancer treatment can be given in many different forms, the most common are the following 2 types:

Oral route;

Intravenous injection or infusion.

There are also a number of other ways to deliver chemotherapy to a patient, including:

Inject chemotherapy directly into the tumor: This technique will be administered based on the location of the tumor.

Topical Treatment: Apply directly under the skin to treat some skin cancers.

On the other hand, Radiation therapy is one of the methods to treat cancer by using high-energy beams to target tumors to help destroy and limit the growth of cancer cells.

Radiation therapy can be used alone in treatment or in combination with other methods such as surgery, chemotherapy...

A simulated CT scan in the treatment position is a scan of the part of the patient's body that will be treated with radiation on a CT scanner in the position that will be used to treat the patient's radiation. The purpose of this stage is to provide an accurate three-dimensional image of the patient's body being treated so that doctors and specialists can establish 3D images on the treatment planning system.



Fig 1 - Medical equipment used in this process
(Source: vinmec.vn, access date 22/8/2022)

2. Using modern technology for Cancer patient treatment

We will refer to a case at Bai Chay hospital in Quang Ninh province.

First is using Smart medical model.

Pioneering the implementation of the project to build a smart hospital, Bai Chay Hospital applies smart medical examination cards with the goal of improving and shortening the medical examination and treatment process, providing high quality medical services, guiding to patient satisfaction.

Bai Chay Hospital has continuously deployed and applied modern and specialized medical techniques and technologies in the fields of general surgery, cranial nerves, spine, oncology, etc., for effective treatment of pathologies, improve the quality of medical examination and treatment services, actively contribute to the socio-economic development of Quang Ninh province. Therefore we emphasizes roles of construction also (DTN Huy, 2012).

From 2018 to now, it is a period of strong "breakthrough" development in the medical examination and treatment of Bai Chay Hospital. The hospital has implemented many cutting-edge techniques in the fields of surgery, oncology, successfully applied minimally invasive treatment methods for serious patients such as surgery for herniated disc through

the lateral route, evaporating prostate tumors by laser, percutaneous biliary lithotripsy, burning liver tumors, thyroid tumors by microwave technology...

Application of Navigazione system, operating room CT, 3D microsurgery in cranial and spinal neurosurgery

Currently, endoscopic or endoscopic surgical methods for craniocerebral and spinal nerve diseases bring many advantages such as less invasiveness, and fewer pre- and post-operative complications compared to other surgical procedures. classics in the past, but the scope of application is still limited in Vietnam. Meanwhile, the majority of cranial and spinal surgeries still apply open surgery, there are still many challenges in damage control and complications during and after surgery.

Pioneering in developing the field of cranial and spinal neurosurgery, Bai Chay Hospital was invested in a smart operating room system with an investment of VND 50 billion from the budget of the Smart Hospital Construction Project. Right after receiving and launching the leading modern smart operating room system in Quang Ninh province from 2018, Bai Chay Hospital has applied the smart operating room system combined with the current Navigation and CT navigation system. modern in cranial and spinal neurosurgery such as percutaneous screw surgery; spine surgery, disc removal and intervertebral bone grafting; brain tumor surgery...

(Source: benhvienbaichay.vn, access date 21/8/2022)



Fig 2 - Quang Ninh invested Modern equipment for medical (Source: internet)

CONCLUSION

Up to now, Bai Chay Hospital in Quang Ninh province has invested many modern medical equipment for their operation

and cancer patient treatment. At the Department of Functional Exploration (Bai Chay Hospital), the doctors and nurses have mastered the modern endoscopic ultrasound technique, which provides fast and accurate diagnosis of diseases of the digestive tract, gallbladder, pancreas, mucosal and extramucosal lesions of the gastrointestinal tract. Especially, through the implementation of endoscopic ultrasound technique, it has helped doctors diagnose and detect early-stage cancer in the gastrointestinal tract when the tumor is still in the mucosa (this is of great significance in the treatment of cancer). treated with a cure rate of 98-100%) or small tumors located deep in the abdomen with minimal invasiveness.

Last but not least, Krist et al (2016) pointed Increasing patients' engagement in their treatment can improve their experience and outcome. It can also yield valuable data for cancer research.



Fig 3: Doctors at Quang Ninh hospital (Source: internet)

RESEARCH LIMITATION

Authors can expand study for women cancer treatment solutions.

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CONFLICTS OF INTEREST

There is no conflict of interest.

REFERENCES

- Cinar P, Bold R, Bosslet BA, et al. (2020). Planning for post-pandemic cancer care delivery: Recovery or opportunity for redesign? *CA Cancer J Clin* 71:34-46.
- Charmsaz, S. et al. (2018). Innovative Technologies Changing Cancer

- Treatment, *Cancers* (Basel). 2018 Jun; 10(6): 208.
- Crisp, N. et al. (2014). Chemotherapy at home: Keeping patients in their “natural habitat”, *Canadian oncology nursing journal = Revue canadienne de nursing oncologique* 24(2): 89-101.
DOI:10.5737/1181912x2428994
- Ahlbrandt J. et al. (2020). Modern Information Technology for Cancer Research: What’s in IT for Me? An Overview of Technologies and Approaches, *Oncology* 2020; 98: 363–369.
<https://doi.org/10.1159/000493638>
- DTN Huy. (2015). The critical analysis of limited south asian corporate governance standards after financial crisis, *International Journal for Quality Research* 9 (4).
- DTN Huy, TH Le, NT Hang, S Gwoździewicz, ND Trung, P Van Tuan. (2021). Further Researches and Discussion on Machine Learning Meanings-And Methods Of Classifying and Recognizing Users Gender on Internet, *Advances in Mechanics* 9 (3), 1190-1204.
- DT Tinh, NT Thuy, DT Ngoc Huy. (2021). Doing Business Research and Teaching Methodology for Undergraduate, Postgraduate and Doctoral Students-Case in Various Markets Including Vietnam, *Elementary Education Online* 20 (1).
- DTN Huy, PN Van, NTT Ha. (2021). Education and computer skill enhancing for Vietnam laborers under industry 4.0 and evfta agreement, *Elementary Education Online* 20 (4).
- DTN Huy. (2012). Estimating Beta of Viet Nam listed construction companies during the crisis, *Journal of Integration and Development* 15 (1), 57-71.
- DTN Huy, NTT Hanh, NT Hang, PTH Nhung, NTP Thao, LT Han, DT Sang. (2021). General solutions for enhancing quality of teachers during globalization in emerging markets including Vietnam-and some pedagogy psychological issues, *Psychology and Education Journal* 58 (4), 2343-2349.
- DTN Huy. (2015). The critical analysis of limited south asian corporate governance standards after financial crisis, *International Journal for Quality Research* 9 (4).
- H Van Thuc, DTT Thao, NN Thach, VT Dung, DTN Huy, NTP Thanh. (2020). Designing Data Transmission System with Infrared Rays, *Psychology and education* 58 (2), 3406-3411.
- Hac LD, DTN Huy, NN Thach, BM Chuyen, PTH Nhung, DT Tran, TA Tran. (2021). Enhancing risk management culture for sustainable growth of Asia commercial bank-ACB in Vietnam under mixed effects of macro factors, *Entrepreneurship and Sustainability Issues* 8 (3).
- HT Hanh, BM Chuyen, DTN Huy, NTT Phuong, HTL Phuong, LN Nuong. (2020). CHALLENGES AND OPPORTUNITIES FROM IMPACTS OF FDI AND INCOME ON ENVIRONMENT POLLUTION: ROLE OF FINANCIAL ACCOUNTING TRANSPARENCY IN FDI FIRMS, *Journal of Security & Sustainability Issues* 10 (2).
- Le, K., & Nguyen, M. (2020). Aerial bombardment and educational attainment. *International Review of Applied Economics*, 34(3), 361-383.
- Maas S.L.N., Breakefield X.O., Weaver A.M. (2016). Extracellular vesicles: Unique intercellular delivery vehicles. *Trends Cell Biol.* 2017; 27: 172–188. doi: 10.1016/j.tcb.2016.11.003.
- Kang H, Haswell E. (2020). Patient flow analysis using real-time locating system data: A case study in an outpatient oncology center. *JCO Oncol Pract* 16:e1471-e1480.
- Krist AH, Nease DE, Kreps GL, Overholser L, McKenzie M. (2016). Engaging Patients in Primary and Specialty Care. *Oncology Informatics*. Elsevier; pp. 55–79.
- N Thi Hang, D Thi Tinh, DT Ngoc Huy, PT Hong Nhung. (2021). Educating and training labor force Under Covid 19; Impacts to Meet Market Demand in Vietnam during Globalization and Integration Era, *Journal for Educators, Teachers and Trainers*, 12(1).
- NN Thach, HT Hanh, DTN Huy, QN Vu. (2021). technology quality management of the industry 4.0 and cybersecurity risk management on current banking activities in emerging markets-the case in Vietnam, *International Journal for Quality Research* 15(3).
- NT Hoa, DTN Huy, T Van Trung. (2021). Implementation of students's scientific research policy at universal education institutions in Vietnam in today situation and solutions, *Review of International Geographical Education Online* 11 (10), 73-80.
- NTT Phuong, DTN Huy, P Van Tuan. (2020). The evaluation of impacts of a seven factor model on nvb stock price in commercial banking industry in vietnam-and roles of Discoloure of Accounting Policy In Risk Management, *International Journal of Entrepreneurship* 24, 1-13.
- N ThiHoa, NT Hang, NT Giang, DTN Huy. (2021). Human resource for schools of politics and for international relation during globalization and EVFTA, *Elementary education Online* 20 (4).
- Nguyen Thi Minh Chinh, Pham Thi Bich Ngoc, Nguyen Minh Loi, Dinh Thi Thu Hang, Dinh Tran Ngoc Huy, Pham Van Tung. (2021). Deepening Analysis on Preventing Fall Risk with Knowledge and Practices of Nurses and Nursing, *Sys Rev Pharm*, 12(3): 308-313.
- N Van Dat, DTA Nhi, DTN Huy. (2021). Improving Tourism Entrepreneur’s Competition during the COVID 19 Pandemic–A Case Study in Tourism Industry in Vietnam, *Revista Geintec-gestao Inovacao E Tecnologias* 11 (3), 112-126.
- NTHIQ HUONG, BUIX NHAN, DTN HUY, NTHI TU. (2021). Factors Affecting The Decisions Of Local People To Participate In Community Tourism In The NorthWest of Vietnam, *Journal of Contemporary Issues in Business and Government| Vol 27* (2).
- PN Tram, DT Ngoc Huy. (2021). Educational, Political and Socio-Economic Development of Vietnam Based on Ho Chi Minh’s Ideology, *Elementary Education Online* 20 (1).
- Pham Thi Bich Ngoc, Dinh Tran Ngoc Huy, Vu Thanh Binh, Pham Thi Hong Nhung and Ngo Huy Hoang. (2021). Extra Analysis of Health Care Policy for Patients with Corona Virus during COVID 19 and with Chronic Heart Failures and Roles of Nurses at Hospitals in Vietnam, *Journal of Pharmaceutical Research International*, 33(47A).
- PM Dat, DTN Huy. (2021). Management Issues in Medical Industry in Vietnam, *Management* 25 (1), 141-154.
- PTB Ngoc, NH Hoang, DTT Hang, DTN Huy, NTM Chinh, VT La. (2020). Evaluating fall prevention for patients at Nam Dinh Hospital in Vietnam, *European Journal of Molecular and Clinical Medicine* 7 (10), 3114-3119.
- Rose, D. H., Gravel, J. W. (2009). Getting from here to there: UDL, global positioning systems, and lessons for improving education. In Gordon, D. T., Gravel, J. W., Schifter, L. A. (Eds.), *A policy reader in universal design for learning* (pp. 5-18). Cambridge, MA: Harvard Education Press.
- Shi J., Kantoff P.W., Wooster R., Farokhzad O.C. (2017). Cancer nanomedicine: Progress, challenges and opportunities. *Nat. Rev. Cancer*. 2017;17:20–37. doi: 10.1038/nrc.2016.108.
- TTB Hang, DTH Nhung, DTN Huy, NM Hung, MD Pham. (2020). Where Beta is going–case of Viet Nam hotel, airlines and tourism company groups after the low inflation period, *Entrepreneurship and Sustainability Issues* 7 (3).
- TTH Ha, NB Khoa, DTN Huy, VK Nhan, DH Nhung, PT Anh, PK Duy. (2019). Modern corporate governance standards and role of auditing-cases in some Western european countries after financial crisis, corporate scandals and manipulation, *International Journal of Entrepreneurship* 23 (1S).
- TH Le, DTN Huy, NT Le Thi Thanh Huong, SG Hang. (2021). Recognition of user activity with a combined image and accelerometer wearable sensor, *Design Engineering*, 6407-6421.
- Vu Thanh Binh, Dinh Tran Ngoc Huy, Pham Thi Bich Ngoc, Pham Thi Hong Nhung, Dinh Tran Ngoc Hien and Ngo Huy Hoang. (2021). Effective Medicine Treatment for Corona Patients at Home in COVID 19 Pandemic - and Roles of Nurses and Doctors for Heart Failures Treatment, *Journal of Pharmaceutical Research International*, 33(47A).
- VQ Nam, DT Tinh, DTN Huy, TH Le, LTT Huong. (2021). Internet of Things (IoT), Artificial Intelligence (AI) Applications for Various

Sectors in Emerging Markets-and Risk Management Information System (RMIS) Issues, *Design Engineering*, 609-618.

VT Binh, DTN Huy. (2021). Further Analysis on Solution Treatment for Diabetes of Patients at Hospitals in Vietnam, *NeuroQuantology* 19 (8), 88-93.

VT Binh, DTN Huy. (2021). Further Analysis on Characteristic of Diabetic Reinopathy-A Case in Thai Binh Province in Vietnam, *NeuroQuantology* 19 (6), 61-67.

Y. Inagaki, K. Shiraki, K. Sugimoto et al. (2016). Epigenetic regulation of proliferation and invasion in hepatocellular carcinoma cells by CBP/p300 histone acetyltransferase activity, *International Journal of Oncology*, vol. 48, no. 2, pp. 533–540.

Yip et al. (2019). Putting patients first: an inventive service delivering cancer treatment at home, *Journal of comparative effectiveness research*, 8(12)

Zhai, B., & Sun, X.Y. “Mechanisms of resistance to sorafenib and the corresponding strategies in hepatocellular carcinoma,” *World Journal of Hepatology*, vol. 5, no. 7, pp. 345–352, 2013.