



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## Continuing cancer care in a religious facility: A feasible alternative in the COVID-19 Pandemic Era?

Jose Enrique Montoya<sup>a,\*</sup>, Lorraine Marie Item<sup>b</sup>, Shaira Ann Ganggay<sup>c</sup>, Katrin Jovellanos<sup>c</sup>,  
Jonah Marie Punzalan<sup>c</sup>, Glory Baltazar<sup>d</sup>

<sup>a</sup> Section of Medical Oncology, Department of Internal Medicine, Bataan General Hospital and Medical Center, Philippines

<sup>b</sup> Section of Pediatric Hematology and Oncology, Department of Pediatrics, Bataan General Hospital and Medical Center, Philippines

<sup>c</sup> Division of Nursing, Bataan General Hospital and Medical Center, Philippines

<sup>d</sup> Medical Centre Chief, Bataan General Hospital and Medical Center, Philippines

### ARTICLE INFO

#### Keywords:

COVID-19  
Cancer care  
Chemotherapy  
Religious facility  
Bataan  
Philippines  
Pandemic

### ABSTRACT

The advent of the COVID-19 pandemic has stretched most healthcare systems to the point that if no adaptations are made, failure will likely happen. The Philippine healthcare system, with its meager resources, is very much vulnerable to this. During the start of the pandemic, Bataan General Hospital and Medical Center has been converted to a COVID-19 hub, leaving cancer care and treatment displaced. We describe our experience in the feasibility of using a religious facility as an interim place for continuing oncology treatment. An outpatient chemotherapy unit was set up using the main hall of the Residencia Sacerdotal, a religious facility, in Bataan. General practices for infection control, workflow and service delivery were in accordance with existing guidelines. A total of 56 adult patients and 22 pediatric patients were seen for chemotherapy during the period of April 28 to July 15, 2020. A total of 144 chemotherapy sessions for adults and 190 sessions for pediatric patients were done. Fifty nine patients (43 adults and 16 pediatric) were tested for COVID-19 RT PCR (GeneXpert®), as baseline prior to chemotherapy, and all were negative. During the course of treatment, adverse events were noted including infusion reactions, hematologic complications which resolved without any complications. No nosocomial infection was recorded both for patients and healthcare workers. To conclude, in the COVID-19 Pandemic Era adapting to the situation is the best way forward. In our setting, continuing cancer care in a religious facility is a feasible alternative.

### 1. Introduction

The Philippines diagnosed its first COVID-19 case last January 30, 2020 from a visiting couple from China [1]. The first local transmission of the virus was confirmed March 7, 2020 [2]. Since then, the virus has spread across the archipelago at a devastating rate, such that the government had to institute measures, such as the Enhanced Community Quarantine, which started March 17, 2020, to control its spread and at the same time, buy time for the health system to build up needed structure to accommodate patient surge, improve diagnostics, purchase personal protective equipment and provide training to healthcare workers for infection control [3].

As the Bataan General Hospital and Medical Center (BGHMC) was converted to a dedicated COVID-19 hospital on April 17, 2020, the main aim of our oncology-chemotherapy unit was to continue to deliver

cancer care in spite of the pandemic [4]. Given that our chemotherapy unit is the largest in the Bataan Peninsula, with an average of 33 new adult, 8 new pediatric patients seen every month, and a total of 1460 adult chemotherapy, and 860 pediatric chemotherapy sessions for the year 2019, it was imperative to provide a safe place to conduct chemotherapy. Based on previously published articles, cancer and COVID-19 do not mix well, as outcome tends to be on the worst side if cancer patients get the COVID-19 infection during treatment [5,6]. To segregate cancer patients from the rest of the regular patients, as well as to continue chemotherapy sessions, there was a need to have an interim place for cancer care. However, during this pandemic, most government facilities, gymnasium, schools were converted to quarantine facilities; hotels, and resorts were converted to dormitories for healthcare workers. As time is of the essence, and with limited elbow room to look for other options, BGHMC, along with the Government of Bataan

\* Corresponding author.

E-mail address: [Jymontoya@themedicalcity.com](mailto:Jymontoya@themedicalcity.com) (J.E. Montoya).

<https://doi.org/10.1016/j.jcipo.2020.100269>

Received 23 July 2020; Received in revised form 14 November 2020; Accepted 15 December 2020

Available online 24 December 2020

2213-5383/© 2020 Elsevier Ltd. All rights reserved.

accepted the offer of the Diocese of Bataan to convert the main hall of Residencia Sacerdotal, a religious facility, as the interim place for the continuation of our chemotherapy sessions.

We describe in this manuscript our unconventional experience while delivering cancer care during the time we moved to a religious facility for chemotherapy.

## 2. Outpatient chemotherapy unit

As we moved to the interim facility the main intent is to deliver cancer care in an offsite setting without compromising patient safety. Our key priorities are: minimal to no transmission of infection specifically COVID-19 or any infection for both patients and healthcare providers; minimal adverse events during chemotherapy such as infusion reactions and hematologic complications; establish a consistent and continuous supply of logistics such as medicines and medical supplies, personal protective equipment, disinfectants, food and water to ensure smooth operation; and keep communication lines open all the time between community leaders, provincial government and patients.

We adapted the Department of Health (DOH) established recommendations and guidelines regarding temperature screening, physical distancing, and wearing of personal protective equipment, as well as case definitions for suspected COVID-19 cases [7]. Oncology staff who were assigned to the facility did not have any previous exposure to suspicious COVID-19 cases and tested negative for COVID-19 by Reverse Transcriptase Polymerase Chain Reaction (RT PCR) prior to deployment. Due to limitations in facility and manpower, only adult patients fulfilling the “High” and “Medium” Priority based on the European Society of Medical Oncology guidelines in cancer care prioritization during COVID-19, were considered for chemotherapy. These included cancer patients with visceral crisis, life threatening malignant conditions, and those with treatments affecting significant overall survival benefit, as well as those patients whose treatment delay of 6 weeks could potentially affect overall outcome [8]. For pediatric patients, all children with cancer are accepted for diagnostics and chemotherapy, as it is recommended that cancer care for children should not be delayed during COVID-19 [9].

Initial screening was through a phone call with the oncology nurse within one to two days before chemotherapy sessions—with history taking, pertinent on fever, cough, colds, sore throat, diarrhea, as well as recent travel to COVID-19 hot spots. If asymptomatic, patient was scheduled for chemotherapy. Upon arrival at the facility, weight, height, and vital signs are taken. Temperature was screened twice using a thermal scanner. Patients with temperature of 37.3 °C and above were referred to the COVID-19 triage of BGHMC. Patients were required to wear masks, and practice routine hand hygiene with 70 % isopropyl alcohol upon entry. Patients were also advised to have laboratory results consisting of complete blood count, renal and liver panel done prior to arriving at the facility. Adult patients were advised to come alone, while pediatric patients came with one parent. Due to the placement of lock down (enhanced community quarantine), public transportation was not available [10]. Patients were brought in to the facility by vehicles from the Barangay or Provincial Government.

Physical set up of the facility, with triage at the entrance, provisions for alcohol hand rubs, physical distancing of patients/ beds at least 2 m apart, and proper personal protective equipment of healthcare personnel (consisting of N95 mask, face shield, and splash resistant long gowns, 2 layers of gloves) were in accordance with the WHO infection and control guidelines [11]. Initial examination was then performed by the Oncologist on duty. Chemotherapy orders were ordered thru BGHMC Electronic Medical Record. Chemotherapy medicines were prepared by the BGHMC pharmacy and were brought in by an ambulance. Administration of cytotoxics were in accordance with our internal quality control manual, with checks for dual identifiers as well as a checklist timeout before actual start. Monitoring of chemotherapy procedure was then done by the oncology nurse.

The makeshift chemotherapy unit was laid with 10 folding beds. Disinfection was done right after each chemotherapy session. Emergency kits were available including chemotherapy spill kits, crash carts with defibrillators, and emergency oxygen tanks. Furthermore, an ambulance was always on standby should there be a need to bring any patient to the hospital. Chemotherapy sessions were done three times a week with Mondays and Thursdays for adult patients, and Wednesdays for pediatric patients. As part of the pandemic support, chemotherapy expenses were free of charge, and are shouldered by the BGHMC.

By the month of June, the BGHMC had its RT PCR COVID-19 (GeneXpert®) laboratory operational [12]. As per protocol, all new patients for chemotherapy were subjected to baseline COVID-19 testing, with retesting if with symptoms. Oncologists, and chemotherapy nurses were subjected to routine RT PCR swabs every 4 weeks, and were required to answer a pre-duty symptom checklist. If with any symptom such as sore throat, fever, cough or colds, healthcare personnel were not allowed to go on duty, instead were advised to go to employee clinic.

## 3. Results

BGHMC Oncology Unit used the Residencia Sacerdotal Facility from April 28, 2020 to July 15, 2020, (2.5 months). During this period, 66 adult patients were initially screened and 56 of them (84.84 %) fulfilled the criteria of Medium and High Priority based on ESMO guidelines. Out of 56, 45 (80.36 %) of them were female and 11 (19.64 %) were male. Invasive ductal carcinoma was the most common diagnosis, followed by the gastrointestinal malignancies. A total of 144 adult chemotherapy sessions were done, with weekly paclitaxel being the most commonly used regimen (Table 1). Using the ESMO guidelines on cancer

**Table 1**  
Clinical profile of adult oncology patients during the period (N = 56).

Variable	Results
Age (in years)	Mean ± SD = 54.93 ± 13.03 Min = 26 Max = 76
Sex (# of patients)	Female = 45 (80.36 %) Male = 11 (19.64 %)
Diagnosis (# of patients)	Invasive Ductal Carcinoma = 33 (58.93 %) Colon Adenocarcinoma = 7 (12.50 %) Rectal Adenocarcinoma = 5 (8.93 %) Nasopharyngeal Carcinoma = 4 (7.14 %) Cervical Carcinoma = 2 (3.57 %) Hodgkin Lymphoma = 2 (3.57 %) Angiosarcoma = 1 (1.79 %) Gastric Adenocarcinoma = 1 (1.79 %) Thymic Carcinoma = 1 (1.79 %)
Cancer Patient Prioritization (ESMO Tiered Approach) (N = 56)	High = 39 (70 %) Medium = 17 (30 %) Weekly paclitaxel = 45 (31.25 %) Capecitabine = 22 (15.28 %) CapeOx = 16 (11.11 %) AC = 14 (9.72 %) Docetaxel = 13 (9.03 %) Gemcitabine Carboplatin = 11 (7.64 %) Paclitaxel Carboplatin = 10 (6.94 %) ABVD = 6 (4.17 %) Tamoxifen = 3 (2.08 %) GemOX = 2 (1.39 %) Trastuzumab = 2 (1.39 %)
Total number of chemotherapy sessions during the period (N = 144) by type for the same set of patients (N = 56)	

prioritization, 39 patients (70 %) were high priority (patients with on neoadjuvant treatment/ adjuvant, visceral crisis, those with urgent need for chemotherapy), and the remaining 17 (30 %) were considered medium priority (metastatic breast cancer patients on 2nd and 3rd line therapy, postmenopausal stage 1 breast cancers on endocrine therapy, adjuvant chemotherapy high risk stage 2 colon, adjuvant chemotherapy rectal cancer). Comparing with our 2019 adult patient census, there was a 33 % decrease in patient volume.

During the 144 chemotherapy sessions, a total of 6 adverse events (4.16 %) were recorded using Common Terminology Criteria for Adverse Events (CTCAE) ver 5.0 [13]. Two events comprised of infusion reaction with paclitaxel, which required initial cessation of the drug, and administration of diphenhydramine and hydrocortisone with complete resolution of symptoms (Table 2).

Meanwhile, a total of 22 pediatric patients were treated during the above time frame, with 14 boys and 8 girls. Acute Lymphoblastic Leukemia was the most common diagnosis. A total of 190 pediatric chemotherapy sessions were done, with L-Asparaginase chemotherapy being the most common procedure (Table 3). Volume of patients is almost same as year 2019. Among children, 5 adverse events were noted, all hematologic and all were resolved. (Table 4).

A total of 59 patients (43 adults and 16 pediatric patients) were tested for COVID-19 RT PCR, and all of them were negative. All healthcare workers were tested negative for COVID-19 PCR in their routine tests.

#### 4. Discussion

The advent of the COVID-19 pandemic has stretched most healthcare systems to the point that if no adaptations are made, failure will most likely happen. While the overall goal in oncology is to continue cancer care in the most efficient but safe way, every effort has to be made to minimize, if not, obliterate spread of COVID-19 [14]. While it is a known fact that cancer and its treatment can cause or worsen immunosuppression which can complicate COVID-19 infection, there is a need to continue to give the cytotoxics as most cancers can become lethal if left unaddressed [15]. However, a meta-analysis by Giannakoulis, showed that among patients with COVID-19, cancer is associated with poor outcomes [16]. Due to above premise, it will be a best strategy to continue cancer care in COVID-19-free hospitals if possible. This will allow COVID-19 hospitals to focus resources in treating COVID-19 patients while a dedicated cancer center free from COVID-19 can push on providing best cancer treatment with minimal worries from the virus [17]. Applying above in our setting, we decided to pursue medical oncology care in a religious facility during the time our main hospital has been converted into a COVID-19 treatment hub to serve the whole province.

The operation of the off-site chemotherapy unit required an active interplay between optimal utilization of manpower, logistics and supplies, venue, patient participation, and commitment from key players and community. Our primary objective was service provision for the immunocompromised cancer patients amidst the pandemic, while practicing best patient care and safety at par with our hospital setup. As expected, we encountered challenges in this setup and we did our best to mitigate them by:

**Table 2**  
Adverse Events – Adults (6 out of 144 sessions = 4.17 %).

Adverse Events	Grade (according to CTCAE ver 5)	N = 6 sessions
Anemia	1	1
Transaminitis	2	1
Nausea/Vomiting	1	2
Infusion Reaction	2	2

**Table 3**  
Clinical Profile of Pediatric Oncology patients during the period (N = 22).

Variable	Results
Age (in years)	Mean ± SD = 6.77 ± 3.59 Min = 1 Max = 15
Sex (# of patients)	Girls = 8 (36.4 %) Boys = 14 (63.6 %)
Diagnosis (# of patients)	Acute Lymphoblastic Leukemia = 19 (86.5 %) Acute Myeloid Leukemia = 1 (4.5 %) Juvenile Myelomonocytic Leukemia = 1 (4.5 %) Hodgkin Lymphoma = 1 (4.5 %) L-asparaginase = 69 (36.3 %) Cytarabine = 30 (15.8 %) Vincristine = 30 (15.8 %) Intrathecal cytarabine, hydrocortisone and methotrexate plus IV Vincristine = 17 (8.9 %) Doxorubicin and Vincristine = 15 (7.9 %) Methotrexate and Vincristine = 13 (6.8 %) Intrathecal cytarabine, hydrocortisone and methotrexate plus Cytarabine = 10 (5.2 %) Cyclophosphamide = 6 (3.2 %)
Total number of chemotherapy sessions during the period (N = 190) by type for the same set of patients (N = 22)	Bone Marrow Aspiration = 5 Intrathecal = 27

**Table 4**  
Adverse Events – Children (5 out of 190 sessions = 2.63 %).

Adverse Events	Grade (according to CTCAE ver 5)	N = 5 sessions
Anemia	3	2
Thrombocytopenia	3	1
Neutropenia	3	2

- Keeping the facility clean and minimizing transmission of infection which was in line with the protocols from WHO and DOH as explained above. Dedicated maintenance personnel were assigned from BGHMC responsible for facility care which include strict disinfection of floor, beds, infusion pumps and IV stands and new clean beddings per patient
- Mobilization of people and supplies during the time of strict community quarantine required the coordination with community leaders: Point to point vehicles (vans with barriers between seats and seat distancing) were provided by the community/government to ferry patients to the off-site chemotherapy unit from their respective locality (with patients required to wear face mask and face shields in transit). Medical supplies and food needed for a given day were managed based on the number of patients to be treated and are delivered by hospital personnel to the site at a given schedule. A dedicated hospital vehicle was used for this purpose.
- Ensuring communication among stakeholders was always open. Mobile phones were utilized extensively (voice and data) to schedule patients of their appointment, screen for health issues and follow up care. We also continued the use of our BGHMC-electronic medical record system which required the setup of an internet connection in our off site center. Regular teleconferences were held with the hospital administration and the government of Bataan to ensure that the flow of logistics and supplies were unhampered.
- Healthcare workers and support personnel's dedication and commitment were key requirements. All personnel were present during the operation and did not take any personal leave and had to work beyond the required working hours due to the difficulties brought about by this pandemic.

On the brighter side, things that went better than expected include

minimal adverse events which were expected as side effects of cytotoxics, no transmission of COVID-19 within the facility, active community participation through donation of supplies such as personal protective equipment, masks, food. As expected, adult patient volume is also much less as compared to pre-pandemic census, due to existing quarantine and guideline based patient selection. To our knowledge, this is the first time a religious facility is converted into an off-site chemotherapy center; and based on our experience, it is feasible as long as practices are within the health standards set [18].

As an added benefit from our setup, the Province's Bishop and Clergy frequently visited the facility and helped promote patient & staff's well being and positive outlook. While this convergence between religious affiliation and cancer care may have some unintended uneasiness for some, the goals of compassion and healing, relief of suffering, and soldiering through this pandemic are universal, and may obviate barriers of any religious association [19]. All above intentions coincide with the Philippines' battle-cry during this pandemic, which is "We heal as one".

## 5. Conclusion

In the COVID-19 Pandemic Era, healthcare structures are challenged, and adapting to the situation is the best way forward. In our setting, continuing cancer care in a religious facility is a feasible alternative.

## Ethical statement

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

## Declaration of Competing Interest

The authors report no declarations of interest.

## References

- [1] E.M. Edrada, E.B. Lopez, J.B. Villarama, et al., Correction to: first COVID-19 infections in the Philippines: a case report, *Trop. Med. Health* 48 (2020) 30, <https://doi.org/10.1186/s41182-020-00218-7>. Published 2020 May 7.
- [2] DOH Press release (Internet) (cited July 12, 2020). Available from: <https://www.doh.gov.ph/doh-press-release/doh-confirms-local-transmission-of-covid-19-in-ph>.
- [3] Office of the President press release (internet) (Cited July 12, 2020). Available from: <https://www.officialgazette.gov.ph/downloads/2020/03mar/20200316-ME-MORANDUM-FROM-ES-RRD.pdf>.
- [4] PNA Press release (internet) (cited July 12, 2020). Available from: <https://www.pna.gov.ph/articles/1100159>.
- [5] L. Zhang, F. Zhu, L. Xie, et al., Clinical characteristics of COVID-19-infected cancer patients: a retrospective case study in three hospitals within Wuhan, China, *Ann. Oncol.* 31 (7) (2020) 894–901, <https://doi.org/10.1016/j.annonc.2020.03.296>.
- [6] F. Yang, S. Shi, J. Zhu, J. Shi, K. Dai, X. Chen, Clinical characteristics and outcomes of cancer patients with COVID-19 [published online ahead of print, 2020 May 5], *J. Med. Virol.* (2020), <https://doi.org/10.1002/jmv.25972>.
- [7] DOH Administrative Order No 2020-0016 (internet) (cited July 12, 2020). Available from: <https://www.doh.gov.ph/sites/default/files/health-update/ao20-20-0016.pdf>.
- [8] European Society of Medical Oncology Guidelines (Internet) (cited July 12, 2020). <https://www.esmo.org/guidelines/cancer-patient-management-during-the-covid-19-pandemic>.
- [9] M. Sullivan, E. Bouffet, C. Rodriguez-Galindo, et al., The COVID-19 pandemic: A rapid global response for children with cancer from SIOP, COG, SIOP-E, SIOP-PODC, IPSO, PROS, CCI, and St Jude Global, *Pediatr. Blood Cancer* 67 (7) (2020), e28409, <https://doi.org/10.1002/pbc.28409>.
- [10] PNA press release (internet) (cited July 12, 2020). Available from: <https://www.pna.gov.ph/articles/1096849>.
- [11] Infection Prevention and Control during Health Care when Covid 19 is Suspected Interim Guidance 19 March 2020 World Health Organization. (Internet) (cited July 12, 2020). Available from: [https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications/i/item/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125).
- [12] PNA press release (internet) (cited July 12, 2020). Available from: <https://www.pna.gov.ph/articles/1105721>.
- [13] Common Terminology Criteria for Adverse Events (CTCAE) ver 5.0 (internet) (cited July 12, 2020) Available from: [https://ctep.cancer.gov/protocolDevelopment/electronic\\_applications/docs/CTCAE\\_v5\\_Quick\\_Reference\\_8.5x11.pdf](https://ctep.cancer.gov/protocolDevelopment/electronic_applications/docs/CTCAE_v5_Quick_Reference_8.5x11.pdf).
- [14] J. Chiang, V.S. Yang, S. Han, et al., Minimizing transmission of COVID-19 while delivering optimal cancer care in a National Cancer Centre, *J. Cancer Policy* 25 (2020), 100241, <https://doi.org/10.1016/j.jcpo.2020.100241>.
- [15] D. Schrag, D.L. Hershman, E. Basch, Oncology practice during the COVID-19 pandemic, *JAMA* 323 (20) (2020) 2005–2006, <https://doi.org/10.1001/jama.2020.6236>.
- [16] Vassilis G. Giannakoulis, Eleni Papoutsis, Ilias I. Siempos, Effect of Cancer on clinical outcomes of patients with COVID-19: a meta-analysis of patient data, *JCO Glob. Oncol.* 6 (2020) 799–808.
- [17] A. Restivo, R. De Luca, G. Spolverato, et al., The need of COVID19 free hospitals to maintain cancer care, *Eur. J. Surg. Oncol.* 46 (6) (2020) 1186–1187, <https://doi.org/10.1016/j.ejso.2020.04.003>.
- [18] M.N. Neuss, T.R. Gilmore, K.M. Belderson, et al., 2016 Updated American Society of Clinical Oncology/Oncology Nursing Society Chemotherapy Administration Safety Standards, Including Standards for Pediatric Oncology, *Oncol. Nurs. Forum* 44 (1) (2017) 31–43, <https://doi.org/10.1188/17.ONF.31-43>.
- [19] J. Levin, Partnerships between the faith-based and medical sectors: implications for preventive medicine and public health, *Prev. Med. Rep.* 4 (July 27) (2016) 344–350, <https://doi.org/10.1016/j.pmedr.2016.07.009>. PMID: 27512649; PMCID: PMC4972923.