2020 PSW ANNUAL MEETING

Poster Presentation Abstracts

Characterizing Medication Management and the Role of the Pharmacists in Caring for Patients with Cystic Fibrosis: A Work System Approach

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Background: Cystic Fibrosis (CF) is a chronic disease caused by a mutation in the cystic fibrosis transmembrane conductance regulator (CFTR) on chromosome 7. Patients living with CF are prescribed lifelong, complex medication regimens depending on their CFTR mutation type and extent of organ system involvement. Pharmacists are well positioned to support patients with CF in multiple practice settings, leveraging knowledge to educate and identify barriers of medication adherence. Systems Engineering Initiative for Patient Safety 3.0 (SEIPS 3.0) characterizes patients' longitudinal healthcare interactions, such as those living with chronic conditions. With a focus on patient-centered outcomes, the SEIPS 3.0 model connects aspects of the health care system such as clinical pharmacist-provided medication education to outcomes patients value. The objectives of this study were to (1) define patients' CF medication experiences and educational needs using the SEIPS 3.0 model and (2) investigate the CF outpatient clinic and community pharmacist's role in addressing patient challenges.

Methods: Adult patients with CF participated in semi-structured, in-person or telephone interviews. Patients were identified and asked for permission to speak with the research team by the University of Wisconsin Adult CF multidisciplinary medical team. The University of Wisconsin School of Pharmacy study team recruited and obtained oral consent from participants before recording interviews. Open ended interview questions elicited information about patient knowledge and perceptions of CF, medication regimens, preferred educational modalities, and pharmacist interactions. Interviews were professionally transcribed and verified for accuracy by members of the study team. NVIVO Software was utilized for qualitative data analysis through development of a codebook. A work system approach, SEIPS 3.0 model, was applied to categorize themes and analyze data.

Results: Thirty patients were interviewed and included in qualitative analysis. Four themes of the patients' work process emerged: adherence tools, complex medication regimens, medication adjustments, and medication education. Patients value learning from pharmacists and CF healthcare team members, with the most prevalent information sought out being side effects, indication, interactions, and benefits of regimens. Three prevalent themes of patient outcomes emerged, including benefits and side effects of medications, benefits and side effects of general CF treatment, and disease complications. Pharmacists are well positioned for patient interaction in multiple settings, with extensive communication reported in CF clinics, community-based pharmacies, and remote communication platforms with specialty pharmacies. Participants identified opportunities for patient-centered care which pharmacists could address to further support patients with CF. Examples include in-depth CF consultations and support in community pharmacies, providing adherence tool recommendations, reducing poly-pharmacy, and providing medication education across multiple settings.

Conclusions: Preliminary findings suggest a need for pharmacist involvement in the care of patients with CF as indicated by importance of adherence tools, complexity of CF medication regimens, and patient desire for comprehensive medication education to ensure beneficial outcomes. Patients reported a desire to understand the benefits and side effects of medications. Future directions include enhanced pharmacist dialogue with patients in community pharmacies and CF clinic settings.

Evaluation of Diabetes Mellitus Management in People Living with HIV Using Telehealth Services During a Pandemic

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Background: People living with Human Immunodeficiency Virus (PLWH) are at higher risk of having diabetes mellitus due to a variety of reasons including antiretroviral therapy, HIV infection, and race. Optimizing medication therapy and self-management of uncontrolled diabetes in PLWH utilizing guideline directed medical therapy (GDMT) by achieving and maintaining glycemic control is important to prevent disease-related complications.

In March 2020, the SARS-COV2 pandemic (COVID-19) impacted the ability to deliver pharmacist-led diabetes management services in-person via collaborative practice agreements. During this time, telehealth services were utilized to perform diabetes management. To evaluate the effectiveness of management of diabetes mellitus in PLWH using telehealth services during the pandemic, patients were evaluated for optimization of GDMT prior to and post-3 months of telehealth visits during the COVID-19 pandemic.

Methods: Patients included were those with an HIV and diabetes mellitus diagnosis who were referred to a clinical pharmacist for diabetes management or had an HbA1c >7 in March 2020. Data collected included patient demographics, pre/post telehealth HbA1c, fasting blood glucose, serum creatinine, medication list, blood pressure, urine microalbumin/creatinine ratio, comorbidities, and eye, dental, and foot exams within the last year. Diabetes mellitus regimens pre/post telehealth implementation were evaluated and considered optimized if consistent with GDMT recommendations from the 2020 American Diabetes Association Guidelines. Interventions were focused on patients prescribed GDMT or non-GDMT who were not meeting glycemic goals (HbA1c <7).

Excluded patients were those not seen in the medical clinic for over one year or who were managed fully by an external endocrinologist.

Results: Fifty-three patients were included in the review. Twenty-one patients did not have a telehealth visit due to being unable to reach (24%), having an HbA1c <7 for the last 6 months – 1 year (71%), and 1 patient electing to work with registered dietician. For the remaining 32 patients, 74 telehealth visits were conducted, and 138 additional attempts were made to conduct visits. Dose adjustments and recommendations were made and accepted by 60.3% of patients and providers.

Prior to COVID-19, 39% of patients were on optimized GDMT with HbA1c <7; 1.8% were on non-optimized GDMT with an HbA1c <7; 13% were on non-optimized GDMT with an HbA1c >7; and 45% were on optimized GDMT with an HbA1c >7.

After pharmacist-led telehealth services were conducted during COVID-19, 47% of patients were on optimized GDMT with HbA1c <7; 1.8% were on non-optimized GDMT with an HbA1c <7; 13% were on non-optimized GDMT with an HbA1c >7; and 37% were on optimized GDMT with an HbA1c >7. For patients without an updated HbA1c during the review, the pre-COVID HbA1c was carried forward into the final analysis.

The most common reason for patients on optimized GDMT with an HbA1c >7 during the pandemic was lack of an updated HbA1c value (9/20 patients).

Conclusions: Telehealth services offered by pharmacists during the COVID-19 pandemic maintained the number of patients on optimized GDMT with an HbA1c <7. Data will continue to be collected and telehealth services will be offered to optimize diabetes GDMT and prevent long-term complications of diabetes.

Interprofessional Community-based Falls Screening: Finding From Participant Follow-up

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Background: Falls are a serious concern in the growing older adult population. Recognizing personal risk factors and implementing behavior change to reduce falls are key components in maintaining independence and avoiding injury. The aim of this project was to determine participant success rates in implementing formal action plans created during a comprehensive interprofessional falls screening event.

Methods: 82 participants (average age of 82.4 years) were escorted by a health sciences student and assessed at six screening stations. Screenings were performed by physical therapy, occupational therapy, nursing, and pharmacy students and included falls history; gait, strength and balance; home safety and cognition; vision and blood pressure; as well as medications. Using the CDC Algorithm for Falls Risk Screening, Assessment and Intervention, each participant was categorized as having a low, moderate, or high risk of falls. Participants created up to two action plans to reduce their risk of falls. They also had the opportunity to provide contact information and receive a follow up phone call from a student pharmacist one to two months after the event to discuss action plan progress. Successful implementation of the action plan, motivating factors and barriers to achieving the plan were evaluated in the follow up phone calls.

Results: Out of the 82 participants (69 of whom provided contact information), 38 responded to the pharmacy student follow up phone calls. Of those 38 participants interviewed, 22 were categorized as low risk for falls, 10 were moderate, 2 were moderate-high, and 4 were categorized as high risk. While 34 of 38 (89.5%) had acted on at least one action plan, 42.1% of the interviewed participants had acted on both of their action plans within two months of the event. Of the 4 participants who did not act on either action plan, 2 were at low risk, 1 at moderate risk, and 1 at high risk for falls. Successfully implemented action plans included increasing balance and physical exercises, scheduling an appointment with a healthcare provider, and monitoring calcium and Vitamin D intake. Several barriers were identified that limited participants' ability to act on their goals, including recent housing and health-related changes, as well as logistics they faced (time, weather, caregiver duties). Participants cited two main reasons for finding the event informative: health science student participation and comprehensive screenings from various disciplines leading to a holistic approach to the issue of falls risks.

Conclusion: An interprofessional falls screening with purposeful student pharmacist follow up was successful in promoting behavior change and action plan implementation in many screening participants to reduce their falls risk. Pharmacists can play a key role in the interprofessional team by screening for the use of psychoactive medications and recommending calcium and Vitamin D supplementation for bone health and minimized fractures from fall injuries. This community screening event model has great potential in improving older adult participation and efforts towards reducing their personal falls risk.

Evaluation of Initial Therapeutic Dosing of Intravenous Heparin in the Emergency Department Setting

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Background: Therapeutic heparin anticoagulation is a high risk treatment that results in patient safety events at many health care entities due the complex dosing requirements. Mayo Clinic Health System (MCHS) Northwest Wisconsin (NWWI) had identified patient safety events that were reported where patients were initiated on the incorrect initial infusion nomogram starting rate within the Emergency Department (ED). The heparin infusion nomogram is built with an ordered dose range of 0-40 Units/kg/hour to allow nursing titration of the infusion based on resulting heparin anti-Xa assays. Based on the analysis of these events, the patient safety team identified multiple opportunities to improve patient safety at the point of heparin infusion initiation. This project aims to analyze the impact a "warm handoff" between pharmacists and ED nurses at the point of heparin infusion initiation on the accuracy of actual versus expected initial infusion rates in the ED at MCHS NWWI sites.

Methods: Patients were included if they were started on a heparin infusion nomogram within the MCHS NWWI ED. Patients were included from two time periods - April to May 2019 (pre-intervention) or from September to October 2019 (post-intervention). A random selection of 50 patients from these two time periods was selected. The intervention being measured was the impact of a "warm handoff" between pharmacists and nurses at the point of heparin infusion initiation. The action consisted of pharmacists having a verbal conversation with the nurse to validate the expected heparin initiation rate. Each patient's chart was reviewed for accuracy based on ordered nomogram intensity for initial infusion rate relative to actual administrated infusion rate. The primary outcome was the percent of time the initial infusion rate administered matched the ordered initiation rate. Secondary outcomes included any errors identified and other learnings from the chart review

Results: 100 patients were included in the heparin initial infusion rate dosing evaluation, 50 for each pre- and post-evaluation time frame. 69% of patients received the moderate intensity nomogram, 30% received the high intensity nomogram, and 1% received the low intensity nomogram. The evaluation found 100% of patients in both the pre- and post-intervention groups had the initial heparin infusion rate that matched the heparin infusion order.

Conclusion: Patients appear to be receiving the intended initial infusion rate of heparin at initiation within these settings. A larger sample size may be needed to determine the volume of errors and whether the warm handoff had any impact on decreasing initiation errors.

Training of Pharmacists and Prescribers on QT Prolongation Risk Factors and Development of an Algorithm in a Psychiatric Care Setting

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Background: Antipsychotic medications are used routinely in a psychiatric hospital setting. Given their high prevalence, one of the primary adverse drug reaction concerns is that of QT prolongation. In fact, QT prolongation alerts in the electronic health record are some of the most frequently seen by pharmacists and prescribers in this setting. The purpose of this project was to learn the existing challenges with medication management for QT prolongation in a psychiatric hospital and mitigate them appropriately. The approach used was to standardize training for prescribers and pharmacists, with implementation of an algorithm for reference. The aim of this project was to gain the ability to proactively identify and prevent suspected adverse drug reactions by increasing pharmacist and prescriber awareness, an important component of continuous quality improvement. Additionally, an objective was to measure both pharmacist and prescriber confidence in their ability to identify and mitigate QT prolongation risk factors.

Methods: A verbal survey of pharmacists and the pharmacy director was conducted to understand current deficiencies in identifying and mitigating QT risk factors. A review was also performed of the standard labs drawn upon admission to the hospital, as well as provider methodology for identifying and documenting past QT prolongation. Subsequently, from the initial survey, a standardized document was created to educate providers on the QT interval, identify QT prolongation, outline QT risk factors, categorize drugs in the hospital formulary by QT prolongation risk, and provide an algorithm for clinical use during drug initiation and maintenance. Likert-based surveys were administered to pharmacists and prescribers pre and post presentation to rate their confidence in identifying and mitigating QT risk factors. After analyzing the results, a post hoc analysis is being done to monitor the frequency of prescriber entries on individual patients concerning QT prolongation risk factors. This will be compared to the pre presentation frequency.

Results: The first of several presentations yielded surveys from 5 pharmacists at the institution. On a likert scale from 1-10 (1=not confident at all, 10=extremely confident), the pharmacists averaged a score of 5.4 at baseline. After the algorithm was introduced, and education performed, the pharmacists averaged an 8.8.

Conclusion: Given the preliminary results, there is reason to believe that a well-developed algorithm and education on QT prolongation can greatly increase a clinician's confidence and ability to effectively identify and manage QT prolongation risk factors. This is especially important in the psychiatric care setting given the many QT prolonging drugs prescribed. As a result of this project, the organization will be well positioned for proactive monitoring and continuous quality improvement as it relates to QT prolongation.

Pharmacist Impact of COPD Transitions of Care Across Health Systems

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Background: Implement a strategy to identify and improve transitions of care follow up for UW Health (UWH) medically homed patients hospitalized for chronic obstructive pulmonary disease (COPD)-related care at a partnering health system.

Methods: Eligible patients are those >18 years, have a UWH primary care provider, have a COPD-related admission (exacerbation, new diagnosis or problems with COPD medication) and are discharged to home. Patients were identified through a daily notification sent by the partnering health system pharmacy team to the UWH transitions of care pharmacist. The notification included each patient's LACE score, an index of hospital readmission risk. The UWH pharmacist reviewed the hospitalization notes through Epic's Care Everywhere platform and then outreached to eligible patients via phone. The pharmacist outreach emphasized COPD-related medications, included assessment of knowledge, adherence, side effects, affordability and patient's immunization status. Recommendations that required intervention by the provider were sent to either the patient's primary care provider or pulmonologist. Data collection included completion of medication reconciliation, readmission or emergency room visits related to their COPD, LACE score, time to outreach, interventions made and provider acceptance of recommendations.

Results: From 12/3/19 to 3/17/20, 41 patients were called by the UWH pharmacist. Medication reconciliation was performed on all patients, regardless of pharmacist contact, with 100% of patients requiring updates to their UWH medication list. The pharmacist spoke with 26 patients (63.4%). Of those patients, four patients (15.3%) were later readmitted and two patients (7.7%) had emergency room visits related to their COPD during the timeframe. The average LACE score was 9.4. Patients were contacted by the pharmacist an average of 4.15 days after their hospital discharge. In addition, 36 interventions were made. The most common interventions were focused adherence/education counseling (27.8%), optimizing COPD medications (22.2%), immunizations (19.4%) and smoking cessation (16.6%). Provider approval was required for 15 interventions, of which 11 (73%) were accepted.

Conclusion: Collaborating with a partnering health system during transitions of care allows pharmacists to make positive interventions for their medically homed patients in COPD-related care, particularly in focused adherence/education counseling, optimizing COPD medications, recommending immunizations and encouraging smoking cessation.

Piloting a Pharmacy Intern-led Intervention to Promote Guideline-concordant Proton Pump Inhibitor (PPI) Use

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Background: Proton pump inhibitors (PPI's) have been associated with many adverse events, both infectious and non-infectious. The objective of this project was to assess the feasibility of using pharmacy interns to help implement an intervention aimed at preventing patient harm related to long-term PPI use by assessing appropriateness, educating patients, and deprescribing PPI's when applicable. Previously, a pharmacy resident demonstrated successful implementation of a deprescribing intervention. In this next phase, we attempted to determine if a pharmacy intern could continue the same intervention.

Methods: The setting of this study was at a Veterans Hospital in Madison, WI. Participants included all inpatients with an active PPI order, excluding residential rehabilitation and psychiatry patients. A pharmacy intern performed chart reviews to determine if PPI de-escalation was appropriate based on dose, duration, and/or indication using a predefined tool. If applicable, the intern educated patients on the risks of chronic PPI use, and if agreeable, a recommendation was made by the intern to the medical team to de-escalate therapy. After de-escalation, a gastroenterology (GI) pharmacist followed up with patients two weeks after discharge to assess tolerability. Additionally, six physicians, two nurse practitioners, and two inpatient pharmacists were interviewed to gather information about their perceptions of PPI deprescribing.

Results: Charts from 141 patients were reviewed, with interventions made on 31 patients (21.9%). The most common intervention was counseling/interviewing patients about stopping or reducing the PPI (25 patients). Nineteen patients had their PPI dose decreased, five patients had their PPI stopped, and two patients had their PPI changed to an H2RA. Twenty-one patients tolerated PPI de-escalation, and sixteen patients followed up with a GI pharmacist after discharge. On average, it took less than three minutes to conduct a chart review looking for the PPI indication. According to interviews, perceived barriers to implementation of this initiative include time, short length of hospital stay making it difficult to intervene in a timely manner, underappreciated PPI adverse effects, and hierarchy of surgical teams. Facilitators include it being pharmacy-led, utilizing pharmacy interns to relieve pharmacist burden, and primary care provider receptiveness to changes made by inpatient physicians.

Conclusion: This project showed that a pharmacy intern-led intervention is feasible and effective as minimal time and training are required to make a meaningful patient intervention. There is a need for an ongoing process to assess PPI use and intervene when necessary as many PPI prescriptions are still not guideline concordant.

Addressing the Financial Toxicity of Oncology Medications at a Large Academic Medical Center

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Background: Assess out-of-pocket cost savings for oncology patients secured by the patient assistance program team at Froedtert & the Medical College of Wisconsin.

Methods: A retrospective analysis was completed for all prescription claims sent to Froedtert Specialty Pharmacy at Froedtert & the Medical College of Wisconsin from January 2019 to June 2019. Froedtert offers a patient assistance program where a team of certified pharmacy technicians enroll patients in different financial aid programs including manufacturer assistance or foundation grants. The primary outcomes included the amount cost savings provided to patients and the number of individuals enlisted in patient assistance programs and foundation grants. Prescription claims were only included if the patient was dispensed an oncology medication and had an active diagnosis of malignancy. If the patient was approved for a patient assistance program or foundation grant, but the medication was never dispensed, it was excluded. For patients that had insurance, the copay was used to estimate cost savings; for uninsured patients, the average wholesale acquisition cost was used. The 6-month cost savings were extrapolated until the end of the year, or when the patient discontinued the medication.

Results: A total 153 patient assistance programs and foundational grants were received in the 6-month time frame. There were 130 patient assistance programs and 23 foundation grants that were used to help cover costs for the patient. Patients' savings had a range of $75.00 – $368,642.60, and a total of 31 medications were covered. Financial assistance was most commonly used for palbociclib (Ibrance)® followed by osimertinib (Tagrisso®). The total estimated cost saving for all patients was $8,322,115.56.

Conclusion: Using patient assistance programs and foundation grants can greatly decrease the financial burden a patient can experience. This analysis has shown the impact of having a designated service to help patients access these programs to save in out-of-pocket cost. It also helps with patients being able to increase the number of patients obtain specialty oncology medications.

Safety of Empagliflozin in Veterans with Type II Diabetes

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Background: Empagliflozin is a sodium-glucose cotransporter-2 (SGLT-2) inhibitor that works by decreasing the reabsorption of glucose in the kidneys. The American Diabetes Association supports the use of SGLT-2 inhibitors as an adjunct to first-line therapies, particularly in patients with chronic kidney disease, heart failure, or other atherosclerotic disease, as there may be added benefits to using this medication for renal and cardiovascular protection. While this new and innovative medication has many benefits, there are potential adverse events to consider including acute kidney injury, hypotension, urinary tract infections, ketoacidosis, and Fournier's gangrene. Further, there is limited data on the prevalence and risk of adverse events in the Veteran population, which may be at higher risk for adverse drug events due to medical complexity and older age. The purpose of this study was to evaluate the safety of utilizing empagliflozin in the Veteran population.

Methods: Patients with type II diabetes who had an active prescription for empagliflozin at the time of chart review (December 2019) and were at least 18 years of age were included in this retrospective electronic chart review. Out of these patients, 100 patients were selected and randomized via a random number generator and compiling it into a patient list. Excluded from this review were patients who were prescribed an SGLT-2 inhibitor from a provider outside of the VA system. The primary outcomes are to assess the safety of empagliflozin by analyzing the incidence of acute kidney injury, hypotension, urinary tract infections, ketoacidosis and Fournier's gangrene. Data will be summarized using descriptive statistics.

Characteristics of Preceptors who Completed a Continuing Professional Development Training

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Background: EContinuing professional development (CPD) is an individualized cyclic learning approach consisting of four key steps: reflect, plan, learn, and evaluate. The American Association of Colleges of Pharmacy (AACP) promotes the use of CPD for pharmacists and specifically recommends CPD programs for preceptors. Additionally, the Accreditation Council for Pharmacy Education (ACPE) Accreditation Standards requires schools of pharmacy to "foster the professional development of its preceptors." Therefore, a preceptor CPD training program was developed to guide preceptors in creating self-directed learning plans to improve their clinical teaching. The objective of this evaluation was to determine the characteristics of pharmacy preceptors who were more likely to complete the preceptor CPD training.

Methods: All University of Wisconsin School of Pharmacy domestic pharmacist preceptors who were not a pharmacy resident were included in this analysis. As several preceptors were associated with more than one practice site, the dataset was consolidated such that each preceptor was a single entry. Variables assessed include completion of the preceptor CPD training, gender, residency completion, graduate degree(s), years since initial pharmacy licensure, and number of Introductory Pharmacy Practice Experience (IPPE) and Advanced Pharmacy Practice Experience (APPE) students in the last year. Descriptive statistics were performed for all variables and grouped by completion of the CPD training. Fischer's exact test and Wilcoxon rank-sum test was performed for categorical and continuous variables, respectively, by completion of CPD training as normality could not be assumed. Logistic regression was also performed. An alpha level of 0.05 was used to determine statistical significance without adjustment for repeated testing using Stata 15.0.

Results: Out of 1200 preceptors, 473 (39.5%) completed the CPD training. Female preceptors were more likely to complete the CPD training (69%; $p<0.001$). Preceptors who had completed residencies were more likely to complete the CPD training than preceptors without residency (45% and 37% respectively, $p=0.011$). However, preceptors with graduate degrees were less likely to complete the CPD training than those without an additional degree (25.9% and 40.5% respectively, $p=0.01$). Time since initial licensure was not statistically significantly different; the highest proportion of preceptors that completed the CPD training were licensed with 11-20 years of experience and the lowest proportion were licensed with 0-5 years of experience (36% and 14% respectively, $p=0.12$). There was a higher median for number of APPE students precepted in the last year among preceptors who completed the CPD training (4 students) compared to those who did not (2 students; $p<0.001$). Preceptors with more IPPE students were also more likely to complete the CPD training ($p<0.001$). The results of the logistic regression were consistent with the primarily analysis.

Conclusion: Residency trained-pharmacists who precepted a higher number of students were more likely to complete the CPD training. It was surprising that newer preceptors and preceptors with graduate degrees were less likely to complete the CPD training. Knowing the characteristics associated with completing the preceptor CPD training are important in order to devise and target interventions to motivate preceptors to complete the CPD program and improve clinical teaching.

Mechanism of Action and Therapeutic Targets of Novel COVID-19 Vaccines in Progress

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The World Health Organization had declared the outbreak of coronavirus (COVID 19) as pandemic on March 11th, 2020. The emergence of coronavirus and its impact on global health with quick transmission necessitated the need for novel treatments. Multiple research strategies are employed to identify the vaccine targets to combat the infection and reduce the spread by studying the underlying cause of infection. The vaccination development uses various approaches to design a product that helps provide humoral and cell-mediated acquired immune protection against the SARs-CoV-2. The vaccines in progress are based on viruses, nucleic acids, vectors, protein and viral particles to provide effective immunity. It is highly beneficial to understand the biological targets and mode of actions that help to design a vaccine for the COVID 19. The vaccines under development by pharmaceutical companies for the COVID-19 are targeted towards structural and non-structural proteins of the corona virus that are known to be involved in the pathogenesis. In this poster, the vaccination development techniques and various proteins responsibility for the illness caused by the SARs-CoV-2 will be discussed.