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healthcare, yet the ageing workforce means a high number of workers exiting the workforce. Working in close collaboration with the insurer responsible for the healthcare system in New South Wales and Australian Capital Territory, this multi-stage mixed methods project sought to design interventions to support older healthcare workers to return to work after work-related injury/illness.

**Materials and methods:** Evidence gained from literature and workers' compensation claim analysis on existing interventions and risk factors for injury and no return to work was presented to focus groups made up of insurance and healthcare system stakeholders. Across a series of sessions the first 4 of 6 intervention mapping steps were completed.

**Results:** Five possible interventions were presented to the insurer to implement alone or in conjunction with the health organisations to prevent work-related injury or support return to work including: exercise; lifting training and/or equipment; education (at time of injury); return to work management, and; workplace environmental changes.

**Conclusions:** The insurer has already begun to act on the recommendations and create a "Best Practice" guide to support workers and employers alike. Success of this project was largely due to the ability to engage with stakeholders both "on the front line" who regularly deal with injured workers and policy makers to determine what is possible to deliver in practice.

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##### **Alcohol use and risk of work injuries among health care workers: a pilot study**

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**Introduction:** Alcohol use accounts for 11% of all workplace injuries and alcohol-related absenteeism amounts to \$2 billion/year. Literature is lacking of information on potential association between occupational injuries among health care workers and alcohol use. This study aims to conduct a pilot study on alcohol induced injuries in health care workers and analyzes the use of Carbohydrate-Deficient Transferrin (CDT) in health surveillance programs in occupational settings.

**Materials and Methods:** A retrospective study was conducted in a large Local Health Unit in Italy. The sample consisted in 75 cases defined as workers who sustained an occupational injury. We analyzed serum ALT, AST,  $\gamma$  GT, MCV and CDT levels. CDT refers to a temporary alteration in the glycosylation pattern of transferrin that occurs in sustained heavy alcohol consumption (50–80 g of alcohol/day for at least 2 weeks).

**Results:** As for the type of occupational injury, biological injuries 36% are the most common ones, followed by slipping and falls 33%, commuting accidents 15%, musculoskeletal injuries caused by

manual handling 9% and verbal/physical aggressions 7%. Globally the majority of samples had low or medium CDT levels but no one was positive (cut-off value equal to 2%); no gender difference was detected.

**Conclusions:** In the health care sector, alcohol plays a minor role in the occurrence of occupational injuries. The use of CDT in health surveillance protocols could play a role, such as a specific biomarker, as well as a deterrent for operators who may incur in important work sanctions.

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##### **Hepatitis B immunization survey at fitness assessment of newly recruited hospital care workers**

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**Introduction:** Hepatitis B virus (HBV) immunity assessment is mandatory in hospital care workers (HpCW) since HBV is preventable even after significant percutaneous exposure. Anti-HBs specific IgG antibody serum concentration (atHBsIgG), should be above 10 IU/l, a widely accepted protective cutoff. Since most of newly recruited HpCW had a 3-dose recombinant hepatitis B vaccine (rHBvac) under age 16 without any post-vac control, we've conducted a atHBsIgG biohazard preventive survey.

**Methods:** Two year (y) survey (2020–2021) of 550 newly recruited HpCW (F:429 78%; F/M:3.5) submitted to work fitness assessment (13.1% of 4200) with blood testing that included atHBsIgG (IU/l) by CLIA immunoassay.

**Results:** 75 (13.6%; F:60, 34.1±11.4y; M:15, 31.6±8.2y) had aHBsIgG <10 U/l. A single rHBvac boost was administered to 39 (52.0%); a month later, 19 (48.7%) showed protective atHBsIgG but 10 (25.6%) were unresponsive and so fulfilled 3-dose rHBvac. Discussion: A high proportion of new HpCW had low HBsIgG at admission but had a swift response upon single-dose revaccination (boosting fast-responders). A few are "boosting slow-responders" (after 2nd/3rd dose) and some remain "non-responders", candidates for rHBvac+adjuvant.

**Conclusion:** Screening of atHBsIgG is mandatory since percutaneous HBV infection risk (correlated to HBeAg+/HBv-load) implies that lower-than-protective atHBsIgG could impair an effective immediate response to a sudden incidental circulatory viral load.

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##### **Enhanced personal protective equipment can cause acute kidney injury in health care workers during COVID-19 pandemics**

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**Introduction:** Enhanced personal protective equipment (PPE) can expose health care workers (HCWs) to high heat stress and dehydration. The objective of this study was to assess the risk of acute kidney injury (AKI) among HCWs during the pandemic.

**Material and Methods:** We recruited 52 HCWs worked on the mobile COVID-19 screening bus in the summer of 2021. We

measured the body water content, pulse, core body temperature, blood pressure, creatinine, and urinary analysis before and after the work shift. We obtained the amount of water intake, environmental and personal measurements of temperature, humidity, and heat stress index during the work shift. Physicians interviewed the study subjects to confirm their medical history. Paired sample t-tests were used to test the pre and post-measurements.

**Results and Conclusions:** After excluding 18 subjects who did not wear PPE in the pilot study, 34 HCWs were used in the analyses (male: 11.8%; female: 88.2 %). Most of them were nurses, with a mean age of 30.53 years old (SD 6.82). After a work shift, 14.7% of the subjects had incident AKI (1.5 times reference value or increase  $\geq 0.3$  mg/dl). Core body temperature increased 0.27 degree (95% confidence interval [CI]: 0.16 to 0.38), creatinine level increased 0.161 mg/dl (95% CI: 0.11 to 0.22,  $p < 0.001$ ). The estimated glomerular filtration rate (eGFR) showed a significant decline in renal function (-16.82 ml/min/1.73m<sup>2</sup>, 95% CI: -22.47 to -11.17,  $p < 0.001$ ). There was a protective effect of hydration ( $p = 0.09$ ). In conclusion, wearing enhanced PPE can cause kidney injuries. There is an urgent need to develop regulations to prevent AKI among HCWs.

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**Enhance the resilience of health care workers through the clear procedures for adverse events management, and psychological support: Croatian experience**

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**Introduction.** Occupational stress is an important factor affecting health. Difficult working conditions, unexpected situations, and emotional engagement are psychological strains of healthcare workers. Adverse event (AV) is unintended harm to the patient caused by medical management rather than by the underlying disease or condition of the patient. Resilience after AVs is one's capacity to cope with those stressors. We present a Croatia case study in this paper.

**Material and Methods.** This study will cover the regulations and quality standards related to adverse events, register of adverse events in University Hospital Centre Zagreb (UHC Zagreb) and survey for healthcare workers.

**Results.** In Croatia, the law on quality of healthcare requires management of adverse events. Within the documentation of the quality management system in hospital, there is a procedure on the adverse events management (AEs), which clearly defines how to report AEs. Department for quality created a register for AEs and collect the data. Commission on quality of UHC Zagreb discusses AVs and preventive measures. Every year Department for quality research stress at work in a hospital. Employees give high marks to their clear role at work. During the COVID 19 pandemic, significantly more employees stated that they needed psychological support due to emotionally demanding work. A te for psychological support starts to work for all employees at the beginning of the pandemic. At the international level, UHC Zagreb is part of the European researchers' network working on second victims (ERNST), which is important for future activities to increase employee.

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**A multilevel approach to individual and organizational predictors of stress and fatigue among healthcare workers of Paris university hospitals: A longitudinal analysis from the STRIPPS survey**

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**Background:** Healthcare workers are at high risk of experiencing stress and fatigue due to the demands of their work within hospitals. Improving their physical and mental health, thus the quality and safety of care, requires considering factors at both individual and organizational levels. Our objective was to identify the predictors of stress and fatigue in healthcare workers in several wards from Paris university hospitals using a 1-year follow-up.

**Material and Methods:** Multicenter prospective cohort study. Participants were drawn at random from 32 hospital wards in Paris. Perceived stress and fatigue levels were assessed with the PSS-10 and the Pichot scale respectively, every 4 months at T0, T1, T2 and T3. A 3-level longitudinal analysis was performed accounting for repeated measures (level 1) across participants (level 2) nested within wards (level 3).

**Results:** 730 healthcare workers were included (nurses=52.6%; auxiliary nurses=41.1%; physicians=4.8%; midwives=1.5%). Across time, stress remained stable whereas fatigue showed an increasing trend ( $p = 0.02$ ). Best individual-level predictors to explain perceived stress and fatigue were work overinvestment, presenteeism, lack of hierarchical support, low perception of safety culture, professional status and the best ward-level predictors were medical specialty and lower number of beds of the ward.

**Conclusions:** Our results may help identify at-risk healthcare workers and wards, where interventions to reduce stress and fatigue could be focused. These interventions could include manager training to favor better staff support and overall safety culture in healthcare.

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**The need for strengthening occupational safety and health management approach for healthcare workers in Indonesia primary healthcare centers: Lesson from COVID-19**

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**Introduction:** The COVID-19 pandemic has an impact on all people in the world, but burdens more on health workers as frontliners