AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
2022 SCIENTIFIC CONGRESS & EXPO

WORKING WITH FATIGUE: ASSESSMENT OF CYROMANAGEMENT CONDITIONS IN IVF BIOREPOSITORIES

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OBJECTIVE:

To observe the amount of time spent in fatiguing work (bending, lifting and usage of stools and ladders) in the management of in vitro fertilization (IVF) biorepositories.

MATERIALS AND METHODS:

Level checking and filling LN in Dewars was observed at 4 United States (US) IVF centers. In addition, a sampling of the annual Dewar inventory was conducted at each site (~1 Dewar per site). As well as, observing specimen retrievals from storage and moving specimens into storage (at least 12 each per site). Data were captured from 12 subjects (range: 1-5per site) via 2 digital video cameras (Sony FDR AX33) with 256 GB microSD card media. Time datapoints were determined using Movies & TV app (Microsoft, v10.2). Fatiguing time, defined as: 1)time spent bending over (typically looking into Dewars), 2) time lifting heavy objects (typically 2Lliquid nitrogen containers or heavier), 3) time standing on a stool (either working with large format tanks or pulling objects from shelves) was determined. Data is presented as the percentage, calculated by time in fatiguing work out of the total time working with equipment to perform the laboratory tasks.

RESULTS:

Among the 4 US IVF sites, embryologist were observed directly working with cryomanagement biorepository equipment (Dewars) for a total of 07:46:56 (HH:MM:SS). Of the total time, 31.5% (02:26:53) was spent bent over and often at an angle. Embryologist spent 10.8%(00:50:39) of the total time lifting heavy objects while 4.9% (00:23:05) of the total time the use of a tool was

necessary to complete a task. The total fatiguing time for an embryologist was 47.25%(03:40:37)).

CONCLUSIONS:

The data demonstrated that current manual cryostorage equipment relies heavily on fatiguing manual work conditions. Of the work tasks observed in this study, specimen retrieval and storage are required daily, while Dewar level checking and filling of LN are performed at least once per week. Similarly, the annual inventory is not a daily process, but involves a large amount of time spent in fatiguing work. Taken as a whole, the data support that daily working conditions for IVF biorepository cryomanagement are fatiguing, with this stemming directly from the manual nature of the current cryostorage systems.

IMPACT STATEMENT:

The application of automation, with software guided specimen retrieval and storage, along with automated tank filling, coupled with constant telemetry of environmental conditions including LN level checking, while providing for an upright working condition should improve the fatiguing conditions experienced in IVF biorepository cryomanagement.

REFERENCES:

N/A