

## **Project Title**

Reducing Contamination During Urine Specimen Collection

## **Project Lead and Members**

Project leads: Dr Fadzil Hamzah (Senior Staff Registrar); Ms Siti Zubaidah (Principal Enrolled Nurse)

Project members: Santhi Palani, Nurse Clinician; Sng Soh Ging, Principal Enrolled Nurse

## **Organisation(s) Involved**

Changi General Hospital

## **Healthcare Family Group(s) Involved in this Project**

Nursing

## **Applicable Specialty or Discipline**

Sport and Exercise Medicine Centre

## **Project Period**

Start date: June 2020

Completed date: July 2021

## **Aims**

To reduce contamination during midstream urine specimen collection often encountered during health screening examinations

## **Background**

See poster appended/ below

## **Methods**

See poster appended/ below

## **Results**

See poster appended/ below

## **Lessons Learnt**

Clear and effective communication in the workflow is essential in ensuring the smooth operation of any healthcare system/procedure, thus leading to workplace efficiency, better productivity as well as a more pleasant patient experience.

## **Conclusion**

See poster appended/ below

## **Additional Information**

Adoption for the implemented changes is currently ongoing and has been in place for 2 years. Over the next 12 months we aim to implement this initiative at all SSMC satellite centres in other institutions (e.g. Novena Medical Centre, Singapore General Hospital) and other departments within CGH that conduct health/medical screening examinations that include midstream urine sample collection (e.g. Health Screening clinics, Urology clinics, Renal clinics etc).

## **Project Category**

Care & Process Redesign

Quality Improvement, Job Effectiveness

## **Keywords**

Singapore Sports Institute, Pre-Participation Medical Screening

## **Name and Email of Project Contact Person(s)**

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**Aim(s) (Project Background)**

Singapore Sport and Exercise Medicine Centre @ Singapore Sports Institute conducts pre-participation medical screening for approximately 500 national athletes annually. One of the investigations in the medical screening package includes a microanalysis of the midstream urine sample (Figure 1). The instructions to collect a midstream urine sample are given verbally by the nurses at the centre. These instructions may vary and are often misunderstood by the athletes, thus resulting in abnormal test results from inadequate specimen sample or sample contamination. This has further led to the investigations being repeated (Figure 2) as directed by the physicians, hence contributing to delayed results turnover duration, time wastage, additional manpower, increased costs and overall work inefficiency as well as patients' anxiety.

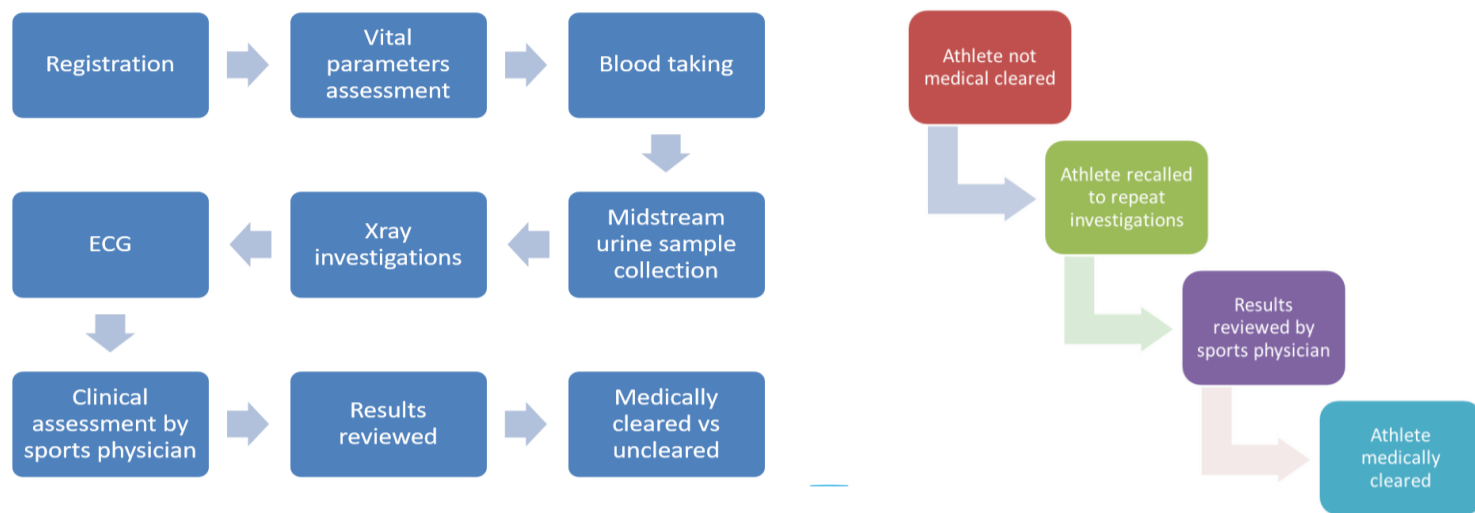


Figure 1

Figure 2

Primarily, we aim to improve the accuracy of the results of the urine microanalysis examination by reducing the number of inadequate and/or contaminated urine samples during midstream urine specimen collection. In addition, we hope to improve workplace efficiency by reducing the need to repeat the investigation, delayed results turnover duration, time wastage, additional manpower requirements and costs. We also aim to improve the patient's experience by reducing the anxiety contributed by the false positive and/or negative results.

We would like to sustain these positive outcomes for at least a year upon implementation of this initiative at Singapore Sport and Exercise Medicine Centre @ Singapore Sports Institute.

**Sustenance Strategies (Methods)**

Our Quality Improvement (QI) project involved creating a set of standardized yet simple instructions for the proper collection of midstream urine that would be read aloud by the nurses as they brief the athletes, and for the athlete's self reading (Figure 3). In addition, this is accompanied by a set of pictorials to illustrate the described method (Figure 4).



- Use this bottle for your urine collection
- Wash your hands and clean yourself thoroughly before collecting your urine sample
- Pass out your urine as per normal
- Do not collect the first stream
- Collect your mid-stream urine only
- Fill half of this bottle

Figure 3



Figure 4

**Results**

There were 315 athletes who attended the pre-participation medical screening at our centre in June 2020, of which 118 (37.5%) of them required to have the urine analysis repeated. (Figure 5).

At 6 weeks post-implementation of our quality improvement initiative, there were 180 athletes who attended the pre-participation medical screening at our centre. Only 33 (19%) of them had the urine analysis repeated. (Figure 6).

**MID-STREAM URINE SAMPLE TEST (JUNE 2020)**

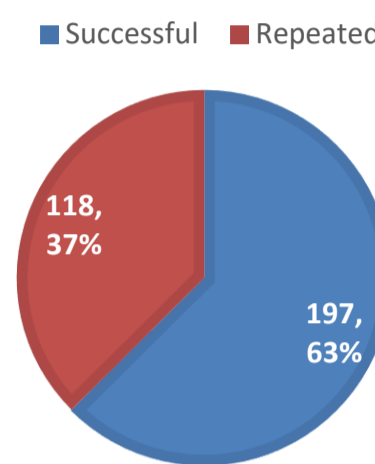


Figure 5

**MID-STREAM URINE SAMPLE TEST (JULY-AUGUST 2020)**

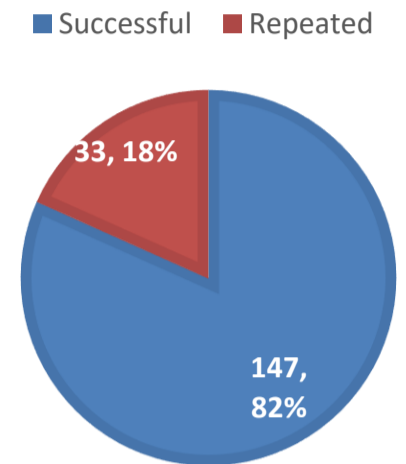


Figure 6

Our centre conducted the pre-participation medical screening for 500 athletes within a period of 12 months (August 2020 – July 2021). 66 (13%) of these athletes repeated their urine analysis (Figure 7). Our quality improvement initiative has not only sustained but also further reduced the number of abnormal test results.

**MID-STREAM URINE SAMPLE TEST (AUG 2020-JULY 2021)**

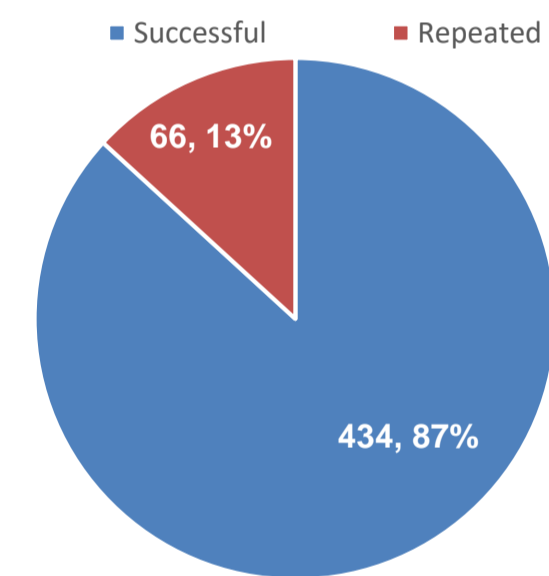


Figure 7

This initiative has also improved workplace efficiency at our centre by reducing the need to repeat the investigation, delayed results turnover duration, time wastage, workload for both the physician, nurses and clinic assistants, manpower requirements and costs.

With less tests repeated, we saved \$305 annually. Total time saving per year was calculated to be 10.16 hours, equivalent to an FTE of 0.0067. The reduced workload thus manpower requirements and/or FTE would enable the department to save a further \$515 per year.

**Conclusion**

Our initiative requires minimal effort and yet significantly improved workplace efficiency, reduced workload and time wastage, manpower requirements as well as overall costs. We would like to enhance our initiative by further developing the pictorials and accompanying instructions for midstream urine specimen collection in various languages and with clearer images.

We will audit the outcomes of our initiative every 6 months, and share the results to all staff during the department townhall. We also hope to share and implement best practices with our satellite centres, other departments and institutions.