

# Androgen Deprivation and Exercise Tolerance

D Spernat, Y Tay, S Donnellan

## Citation

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## Abstract

**Purpose:** it is well established that Androgen deprivation (ADT) has deleterious effects strength, aerobic fitness and functional performance. **Materials and Methods:** we document the performance a man competing and setting age group world records in endurance events in his late 70s to early 80s. This data demonstrates the effects of ADT on his performance, and the subsequent improvement after ceasing therapy. **Conclusions:** ADT improves progression free survival in prostate cancer. However, it results in significant comorbidities such as metabolic syndrome, increased cardiovascular risk, hot flushes, lethargy and gynaecomastia. Furthermore, it does not improve overall survival. ADT has been shown to be associated with a statistically significant worse QoL than local treatment options. Therefore, we recommend that the potential effects of ADT on QoL should be considered when selecting treatment options.

## INTRODUCTION

Androgen deprivation (ADT) has deleterious effects on exercise tolerance [1]. Muscle mass has been shown to decrease between 1.4 and 5.6% [2]. Furthermore, total body fat increases by up to 20.7% [2]. These changes result in a decrease in strength, aerobic fitness and functional performance of 24%, 7%, and 27% respectively [3]. A recently published literature review has shown that there is level A to B evidence that exercise performed 2 to 3 times a week can significantly improve strength, aerobic fitness and functional performance [1].

As this data is acquired from age matched controls and there may be many confounding issues that affect outcome. These patients are generally older and have medical co-morbidities which may potentially affect their strength, aerobic fitness and functional performance.

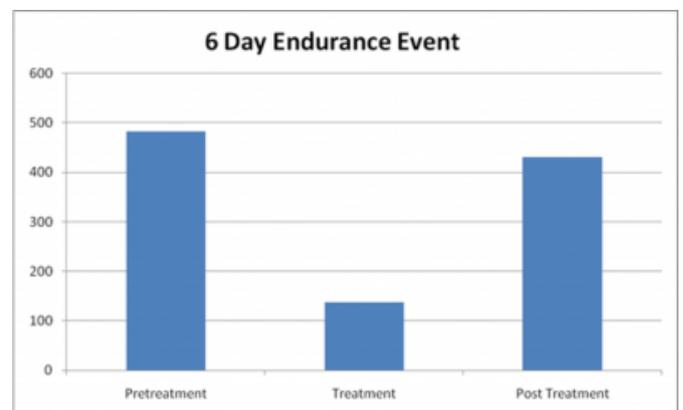
## CASE STUDY

Consequently we document the performance a man competing and setting age group world records in endurance events in his late 70s to early 80s. This data demonstrates the effects of ADT on his performance, and the subsequent improvement after ceasing therapy.

The patient had screening detected prostate cancer and was commenced on ADT. At the time he was competing in endurance events. Symptomatically he noticed a decrease in muscle tone, hot flushes, lethargy and gynaecomastia. Due

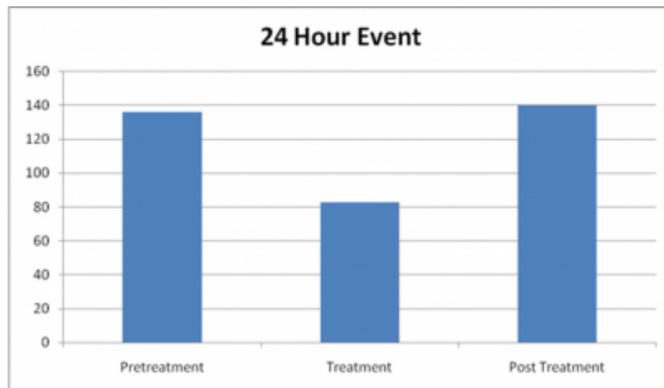
to these changes the patient was unable to continue with ADT. The following graphs demonstrate his performance in both 6 day running races and 24 hour events before the first implant, during treatment and 9 months after ceasing ADT.

**Figure 1**



This graph demonstrates the effect that ADT had on the patient's performance in a 6 day race. Prior to treatment the patient was able to walk 482 km over 6 days and set the world walking record in the 75 to 79 year old age group. However while undergoing treatment with ADT the patient was only able to cover 137 km and retire on day 3 of the event. Nine months after ceasing ADT the patient re-competed in the event and covered 431 km, thus setting a new world walking and running record in the 80 to 84 year old age group.

**Figure 2**



This graph demonstrates the effect that ADT had on the patient's performance in a 24 hour race. Prior to treatment the patient was able to walk 136 km during the 24 hour period and set the world walking record in the 75 to 79 year old age group. However while undergoing treatment with ADT the patient was only able to cover 83 km. Nine months after ceasing ADT the patient re-competed in the event and covered 140 km, thus setting a new world walking and running record in the 80 to 84 year old age group.

### DISCUSSION

ADT improves progression free survival in prostate cancer. However, it results in significant comorbidities such as metabolic syndrome, increased cardiovascular risk, hot flashes, lethargy and gynaecomastia. Furthermore, it does not improve overall survival. This study demonstrates the

profound effects ADT can have on exercise tolerance and therefore quality of life (QoL) in an elderly age group.

The progression of prostate cancer can have severe effects on the QoL of a patient. However, a recent publication assessing the impact of ADT on QoL has demonstrated that ADT was associated with a statistically significant worse QoL than local treatment options. Moreover, the use of ADT as the primary therapy portended to an even worse QoL when compared with combination therapy. Therefore, we agree with the authors of this paper that the potential effects of ADT on quality of life should be considered when selecting treatment options [4].

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**Author Information**

**Daniel Spernat**

Department of Urology, Monash Medical Centre

**Yeng Kwang Tay**

Department of Urology, Monash Medical Centre

**Scott Donnellan**

Department of Urology, Monash Medical Centre