



## Clinical outcomes reporting

The value of care<sup>4</sup> is defined as the results or outcomes (outputs) achieved relative to the cost incurred or resources applied (inputs) to generate these outcomes. To achieve the best and safest care, we must measure both what is being done (processes) and the results achieved (outcomes).

Our clinical outcomes measures are organised in the five themes reported below.

### Theme 1

## Time matters

Under certain conditions, specifically in emergency situations, time is essential to improving outcomes and reducing the cost of care.

## Emergency medical services response time

Netcare 911's 'time saves lives' initiative endeavours to innovatively use technology and big data to reduce response time, a primary indicator of emergency medical services (EMS) effectiveness<sup>5</sup>.

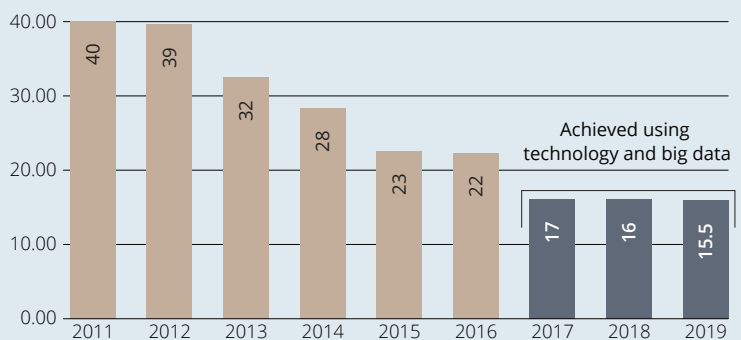
The time it takes from the EMS receiving a call for help to the EMS team arriving and initiating care, is positively correlated with patient outcomes. In 2017, we broke the 20-minute barrier, an achievement that would not have been feasible without the introduction of machine learning processes.

In 2019, we are proud to have achieved a median response time of 15.5 minutes, with our most recent initiatives being:

- The 'Netcare 911 Locate Me' service accessed through the Netcare app uses automated SMS geolocation to identify and auto-populate a caller's address, reducing call handling time and increasing accuracy of location.
- The use of big data and advanced real-time analytics to place vehicles where they are most likely to be needed has resulted in better outcomes without additional resources or cost, meaning we are able to operate a more efficient fleet without compromising the volume of patients transported.

## Netcare 911 outcomes

(lower score is better)



Measure definition: the average (2011-2016) and median (2017 to 2019) time in minutes from call answered to the EMS vehicle's arrival at the scene (response time).

4. Source: Porter, M.E. (2010). What is value in health care? *New England Journal of Medicine*, 36, 2477-2481.

5. Source: Stein, C. et al. (2015). The Effect of the Emergency Medical Services Vehicle Location and Response Strategy on Response Times, *South African Journal of Industrial Engineering*, 26 (2), 26 - 40.

## Improved survival prospects for Priority 1 trauma patients (those requiring immediate resuscitation and stabilisation)

International literature demonstrates a link between trauma-specialised care and a decrease in mortality. We operate the only three accredited Level 1 trauma centres in Africa, certified by the Trauma Society of South Africa. A Level 1 trauma centre is capable of providing leadership and total care for every aspect of injury, from prevention through to rehabilitation, and has 24-hour availability of all major specialties with a trauma surgeon as director.

### Netcare outcomes

Using five years of emergency department data for Priority 1 trauma patients and advanced analytics, the results show that the accredited Level 1 trauma centres at Netcare Milpark and Netcare Union hospitals, achieved a 76% increase in chances of survival for Priority 1 trauma patients, all other things being equal. Netcare St Anne's Hospital is newly accredited and was not included in the study.

## Reducing time to administer antibiotics

Risk of mortality increases by 7.6% for every hour of delay in the administration of antimicrobial therapy in patients with sepsis<sup>6</sup>. Hospital logistics determine 'hang time', defined as the time elapsed from the written antibiotic order to actual intravenous administration. Our improvements in hang time are the result of many operational interventions and close collaboration between our nursing and pharmacy teams.

### Netcare outcomes

Hang time (higher score is better)	2019	2018	2017
Hang time compliance	86.0%	84.8%	77.8%

*Measure definition: the percentage of patients who received the first dose of their antibiotic within one hour of it being prescribed based on data collected by pharmacists reviewing patient charts.*

## Emergency department waiting time (Priority 3 patients) (those with non-urgent, non-critical ailments)

Waiting times for Priority 3 patients vary significantly across emergency departments and tend to be far longer than for more critical patients. Both actual<sup>7</sup> and perceived<sup>8</sup> waiting times impact a patient's experience.

### Key strategic initiative

#### Providing Priority 3 patients with waiting time information

Currently, Priority 3 patients in SA have no access to waiting time information in emergency departments. We are using machine learning to predict waiting time for this group of patients to within a 15-minute interval, taking into account time of arrival, the hospital concerned and the number of patients already being attended to.

The model is being tested with real-time data at Netcare Linksfield Hospital's emergency department. Providing patients with this information enables us to better manage their expectations and gives them the option to visit the hospital in their area with the shortest emergency department waiting time. Our objective is to share waiting times with Priority 3 patients across all our emergency departments.

6. Source: Kumar, A. et al. (2006). Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. *Critical Care Medicine*, 34, 1589-1596.
7. Source: Bleustein, C. et al. (2014). Wait times, patient satisfaction scores, and the perception of care. *American Journal of Managed Care*, 20(5), 393-400.
8. Source: Thompson, D.A. et al. (1996). Effects of actual waiting time, perceived waiting time, information delivery, and expressive quality on patient satisfaction in the emergency department. *Annals of Emergency Medicine*, 28(6), 657-665.