CLINICAL RESEARCH - USE OF CENTRIFUGE

PROCEDURE ©

DOCUMENT SUMMARY/KEY POINTS

- The purpose of this procedure is to ensure the standardised and safe use of centrifuges by clinical research personnel.
- The procedure must be followed by all personnel using centrifuges for clinical research.

CHANGE SUMMARY

- Not applicable – New Sydney Children's Hospitals Network Procedure.

READ ACKNOWLEDGEMENT

- Training/Assessment Required – Personnel using Centrifuges for clinical research.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1st March 2019	**Review Period**: 3 years
Team Leader:	Clinical Trials Program Manager	**Area/Dept**: Kids Research Institute

This Policy/Procedure may be varied, withdrawn or replaced at any time. Compliance with this Policy/Procedure is mandatory.

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Purpose/Scope

The purpose of this procedure is to ensure the standardised and safe use centrifuges by clinical research personnel.

The procedure must be followed by all personnel involved in the conduct of clinical research involving the use of centrifuges.

Background

A centrifuge is a common piece of laboratory equipment that puts an object in rotation around a fixed axis, applying force perpendicular to the axis of the spin.

The centrifuge works using the sedimentation principle, separating the components constituents of bio specimens through the use of centrifugal force based on their density. In a centrifuge used for bio specimen tubes, radial acceleration causes denser particles to settle in the bottom of the vessel, while low-density particles rise to the top.

SCHN has a variety of centrifuges available for clinical research use, including an ambient and refrigerated model in the Clinical Research Centre, Kid's Research.

The following procedure for operation is common to all centrifuge models. Users must also refer to the manufacturer's instructions to obtain the details of operating requirements for specific models.

Equipment and Supplies

- Centrifuge
- Gloves
- Goggles
- Lab coat or gown
- Balancing tubes (as required)
- Spill kit
- Waste Receptacle(s) incl. Sharps Bin (if applicable)

Procedure

The incorrect use of centrifuges can pose a risk to the user, others and the surroundings. All clinical research personnel are required to receive training/assessment prior to any use of centrifuges, documented in accordance with SCHN Policy – Clinical Research - Personnel Qualifications and Training Records [DRAFT].

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Safe Work Practice(s) are posted in the area(s) where centrifuges are located for easy-reference by users.

Use of Centrifuge

- Don PPE including, lab coats, gloves, goggles and enclosed footwear and ensure hair is tied back if long;
- Access and review applicable SDS for any materials to be used, noting any precautions;
- Identify a centrifuge suitable for the intended use;
- Inspect the centrifuge to confirm it is clean and in working order. If anomalies are identified, report the issue immediately to the Research Operations Manager or Delegate. Do not attempt any repairs.
- Ensure that the centrifuge is securely positioned on the bench and that there is adequate space available around the centrifuge (approximately 30 cms of free bench space) ;
- Inspect any bio specimen tubes or balancing tubes to be used – ensuring that the appropriate tube type has been used, the tubes are free of cracking, breakages and/or degradation, and that the maximum volume stored each tube does not exceed 75% of the tubes capacity;
- Complete the log located next to the centrifuge with the details of your usage (if required);
- Switch on the centrifuge;
- If using a refrigerated centrifuge, set the temperature and allow the centrifuge to cool to the set temperature prior to taking further action;
- Ensure the use of the appropriate rotor and buckets for the bio specimen vessels being processed, with reference to the manufacturer's instructions for the centrifuge model being used;
- Ensure that the bio specimen vessels are balanced – by distributing them evenly (mirrored) across the rotor, with consideration of weight;
- Ensure that any aerosol caps are correctly and securely fastened, with reference to the manufacturer's instructions for the centrifuge model being used;
- Close the centrifuge lid firmly and ensure it is secured;
- Set the desired speed for the centrifuge in RCF, as well as the duration of centrifugation;

  Note: The speed of the centrifuge should be specified in RCF as opposed to RPM. RCF represents the absolute value whereas RPM depends upon the rotor size of the centrifuge being used. To calculate RPM or RCF manually, measure the radius of the centrifuge rotor from the centre of the turning axis to the bottom of the centrifuge buckets or equivalent. Calculate the RCF/RPM using the Formulae for Manual Calculation of RCF/RPM.

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- Start the centrifuge but do not leave the laboratory area until the centrifuge has reached the desired speed**.** If any irregular noise comes from the centrifuge once in operation, press the stop button immediately.
- Once the centrifuge has finished its run and all movement has ceased, open the centrifuge lid and inspect that all bio specimen vessels are intact;
- Carefully remove the bio specimen vessels from the centrifuge;
- Switch off the centrifuge;
- Decontaminate the centrifuge using 70% ethanol alcohol wipes;
- Discard any waste in the Clinical waste receptacle and/or sharps bin provided (as appropriate);

Spills

- If the sound of a breakage is heard during operation, turn off the centrifuge and leave the lid closed for 60 minutes to allow any aerosols to settle. If a breakage is discovered when the centrifuge has already stopped and before any samples have been removed, similarly, close the lid and allow 60 minutes to elapse.
- If a breakage or leakage is not noted until the tube holders have been removed, ensure the Research Operations Manager or Delegate is notified to allow cleaning protocols to be conducted immediately.

Appendices

Formulae for Manual Calculation of RCF / RPM

Abbreviations and Definitions

Aerosol Caps	Plastic covers that are either screwed or clipped on to a bucket to provide a complete and air-tight seal.
Bucket	The section of a swing-out rotor that holds the bio specimens.
NSW	New South Wales
PD	Policy Directive
PPE	Personal Protective Equipment
RCF	Relative Centrifugal Force
Rotor	The section of the centrifuge that fits to the motor arm (swing-out or fixed).
RPM	Revolutions Per Minute
SCHN	Sydney Children's Hospitals Network
SDS	Safety Data Sheet

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Related Documents

1. NSW Health PD2017_026 - Clinical and Related Waste Management for Health Services - http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017_026.pdf
2. NSW Health PD2017_013 - Infection Prevention and Control Policy - http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017_013.pdf
3. NSW Health PD2007_052 - Sharps Injuries - Prevention in the NSW Public Health System - http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2007_052.pdf
4. SCHN Policy – Clinical Research [DRAFT]
5. SCHN Policy 2014-9061 - Sharps Injuries - Prevention in the NSW Public Health System - http://webapps.schn.health.nsw.gov.au/epolicy/policy/3295
6. SCHN Policy – Clinical Research - Use of Laboratory Facilities [DRAFT]
7. SCHN Policy 2015-9070 – Waste Management - http://webapps.schn.health.nsw.gov.au/epolicy/policy/3649/
8. SCHN Practice Guideline 2016-9029 - Personal Protective Equipment for Infection Control - http://webapps.schn.health.nsw.gov.au/epolicy/policy/2609
9. SCHN Procedure – Clinical Research - Bio Specimen Collection, Processing and Shipment [DRAFT]
10. SCHN Procedure – Clinical Research - Equipment and Supplies – Maintenance and Calibration [DRAFT]
11. SCHN Procedure - Clinical Research - Personnel Qualifications and Training Records [DRAFT]
12. SCHN Procedure - Clinical Research – Personnel Roles and Responsibilities [DRAFT]
13. SCHN Procedure – Clinical Research - Record Keeping [DRAFT]

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