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# First Human use of a New Robotic-Assisted Navigation System for Small Peripheral Pulmonary Nodules

Initiative Type

Model of Care

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Deliver

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## Summary

This project studied the feasibility of using a new robotic device in sampling small nodules via bronchoscopy. This is a first-in-human study performed at the Royal Brisbane and Women's Hospital

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Bonchoscopy Department. The project team included: Farzad Bashirzadeh, Jung Hwa Son, Marianne Todman, Adrian Chin, Hau Tan, Karin Steinke, Morgan Windsor.

## Key dates

Jan 2017

Jan 2018

## Implementation sites

Royal Brisbane and Women's Hospital

## Key Contacts

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## Aim

To demonstrate safety and efficacy of a new robotic device in sampling small peripheral pulmonary nodules.

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## Benefits

- A bronchoscopic robot device allows direct airway visualisation, great precision, highly directional fine movements in all planes at the catheter tip.
- The catheter stays stationary in any position the physician places it.
- Real-time navigational driving and distal tip articulation of this catheter in pre-clinical studies showed the ability to target peripheral lesions.

## Background

Sampling small nodules in the lung can be very challenging and any advance in this area is welcomed.

## Solutions Implemented

Some of the smallest lung lesions reported in the literature for bronchoscopic biopsy were included in the study. Pre-procedure CT scans were uploaded to the system and navigational pathways were semi-automatically created. Side-by-side viewing of actual and virtual bronchi was used real-time during navigation to the target. Prior to biopsy under fluoroscopy control, an endobronchial ultrasound mini probe was used to confirm lesion location, if Bronchus-sign positive. Specifically-designed flexible transbronchial needle aspiration (TBNA) needles up to 19G were used along with forceps and brushes.

## Evaluation and Results

- Overall diagnostic yield for these cases was 83 per cent and diagnostic yield for malignancy was 89 per cent.
- This robotic-assisted navigation system has safely navigated deep into the lung under continuous visualization to sample very small nodules.
- No device related adverse events occurred; in particular, no instances of pneumothorax or excessive bleeding were observed.

