



## NON-TARGET EMBOLIZATION (NTE)

### An Educational Guide to Embolization Procedures and Related Complications





## COMMON EMBOLIZATION PROCEDURES

- Abnormal bleeding
- Aneurysms
- Arteriovenous Fistula
- Arteriovenous Malformations
- Bronchial/Pulmonary Artery Embolization
- Endovascular Leak (Type I, II)
- Geniculate Artery Embolization
- Hepatocellular Carcinoma
- Nasopharyngeal Angiofibroma
- Ovarian Vein Embolization
- Prostate Artery Embolization
- Renal Tumors
- Splenic Artery Embolization
- Traumatic Bleeding
- Uterine Fibroid Embolization
- Varicocele Embolization

This brochure contains information relating to various embolization procedures and non-target embolization. This information is provided for informational purposes only and is provided as-is without warranty of any kind. It is intended for healthcare professionals only and is not meant to serve as clinical guidance or medical advice.

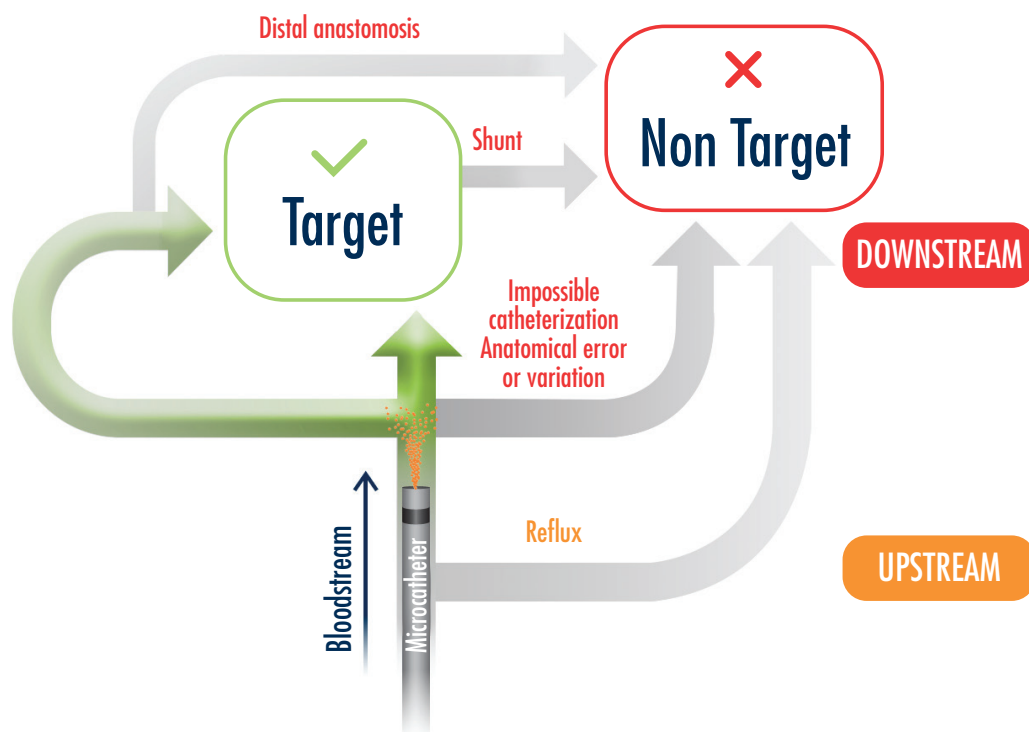
## WHAT IS NON-TARGET EMBOLIZATION?

NTE is a **complication** that occurs when embolic material is **inadvertently deposited** into unintended areas during a **transarterial embolization** procedure.

When using microspheres for embolization, there is a risk of significant complications due to non-target embolization<sup>1</sup>.

The type of procedure along with the vascular anatomy may influence the non-target distribution of embolic particles. Although there is no clear evidence or recommendation guidelines for NTE, it may be beneficial to seek ways to direct therapy appropriately in order to **reduce the risk of non-target embolization**.

## A DOUBLE CHALLENGE FOR UPSTREAM AND DOWNSTREAM OF THE TARGET





## POTENTIAL COMPLICATIONS FROM NON-TARGET EMBOLIZATION



→ Decreased peripheral renal perfusion<sup>3</sup>

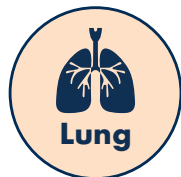


→ Gastritis/Ulcers<sup>2</sup>

→ Pleural effusion<sup>4</sup>

→ Cholecystitis<sup>2,4,1</sup>

→ Pancreatitis<sup>1</sup>



→ Spinal cord ischemia (spinal arteries NTE)<sup>5</sup>

→ Dysphagia (esophageal branches NTE)<sup>6</sup>

→ Ischemic colitis<sup>5</sup>



→ Rectal bleeding<sup>7</sup>

→ Penile ischemia<sup>8</sup>

→ Bladder ischemia<sup>9</sup>

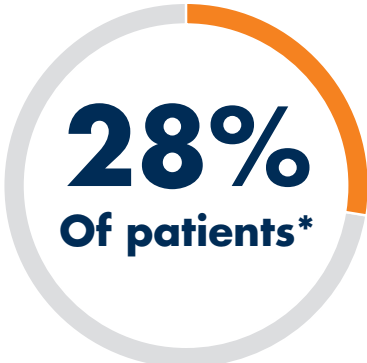


→ Ovarian failure (ovarian vasculature NTE)  
[\*hypothesized]<sup>10</sup>

→ Buttock necrosis<sup>11</sup>

→ Labium minora ulceration (internal pudendal artery NTE)<sup>12</sup>

## AN UNDERESTIMATED IMPACT



**28%**  
Of patients\*

Shown focal necrosis of the liver parenchyma adjacent to the embolized HCC nodule.<sup>13</sup>

\*In a study examining 51 HCC patients

## INDUCE FURTHER PATIENTS' FOLLOW UP



Up to  
**39\*%**

Of incomplete treatment after DEB-TACE.<sup>14</sup>

\*In a study examining 44 HCC patients

## RARELY SYMPTOMATIC BUT CAN BE DRAMATIC



**1**  
Fatal case  
report

Acute necrotizing pancreatitis following DEB-TACE for HCC.<sup>15</sup>

One of the challenges is to avoid Non-Target embolization (NTE) and preserve adjacent tissues. NTE may be minimized by cautious planning and being as targeted as possible. However, presence of small vessels proximal to the target vessel makes it very difficult to control especially when using microspheres that tend to reflux at the tip of the catheter<sup>16</sup>.

## **STEPS TO HELP REDUCE THE RISK OF NON-TARGET EMBOLIZATION**

Embolization procedures require skilled operational techniques. Yet, there may be steps taken to reduce the possibility of NTE.

These Include:

- Understanding the vascular anatomy
- Identifying the non-target vessels
- Positioning the catheter properly
- Choosing the right embolic agent
- Monitoring injection under fluoroscopy
- Using reflux control technologies

## REFERENCES

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