

Imagem em Oncologia

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A.C. Camargo
Cancer Center

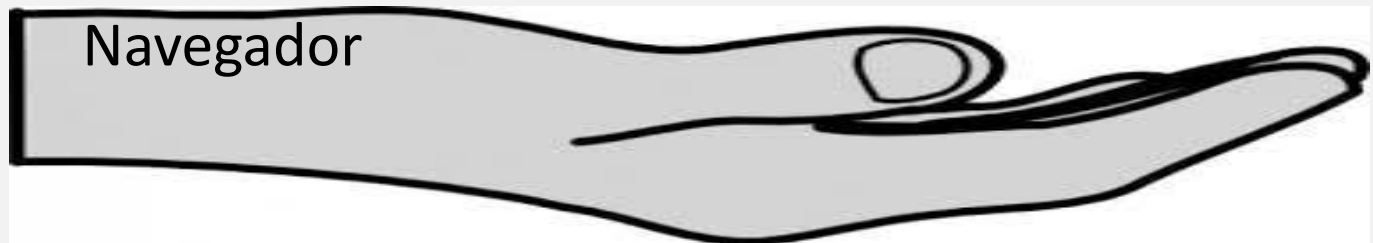
CBR 
Colégio Brasileiro de Radiologia
e Diagnóstico por Imagem

O Modelo Ideal - a partir da Identificação dos Principais Problemas

Acompanhamento Longitudinal – Trajetória do Paciente no Sistema



Momentos críticos de transição do cuidado

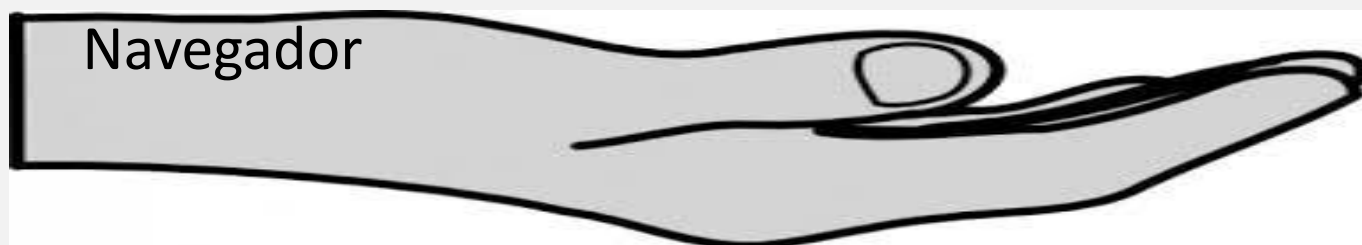


O Modelo Ideal - a partir da Identificação dos Principais Problemas

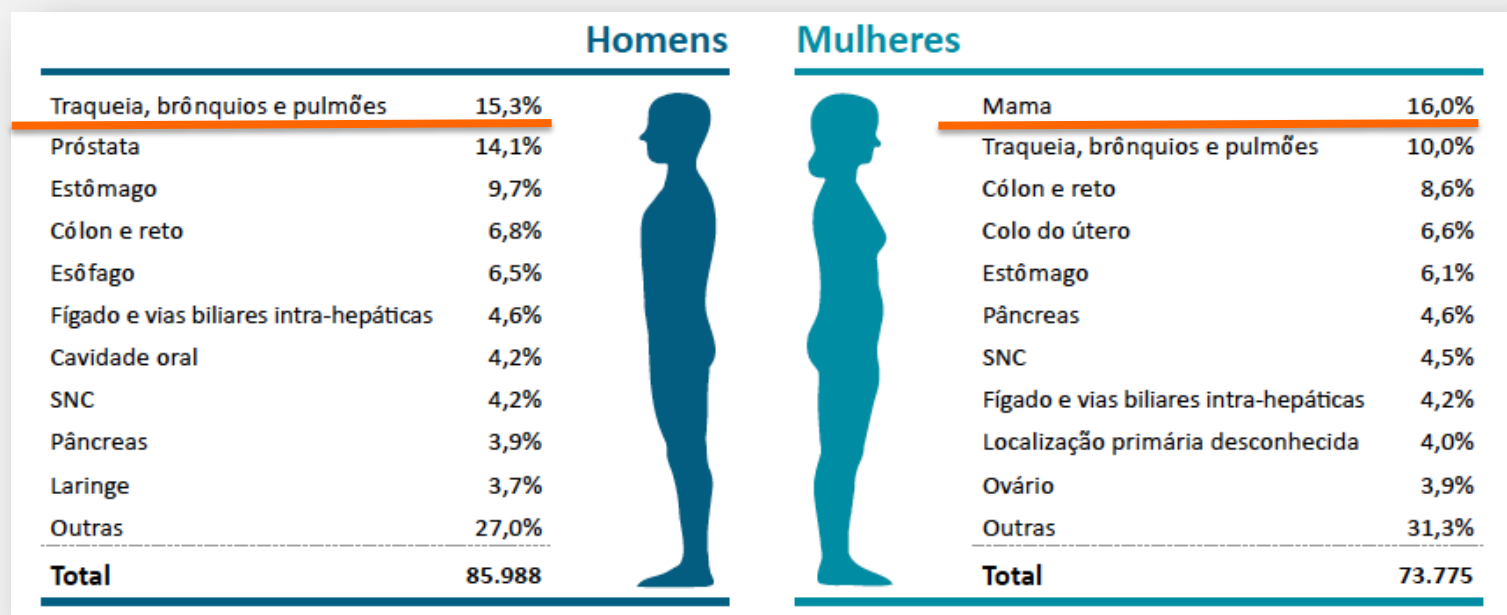
Acompanhamento Longitudinal – Trajetória do Paciente no Sistema



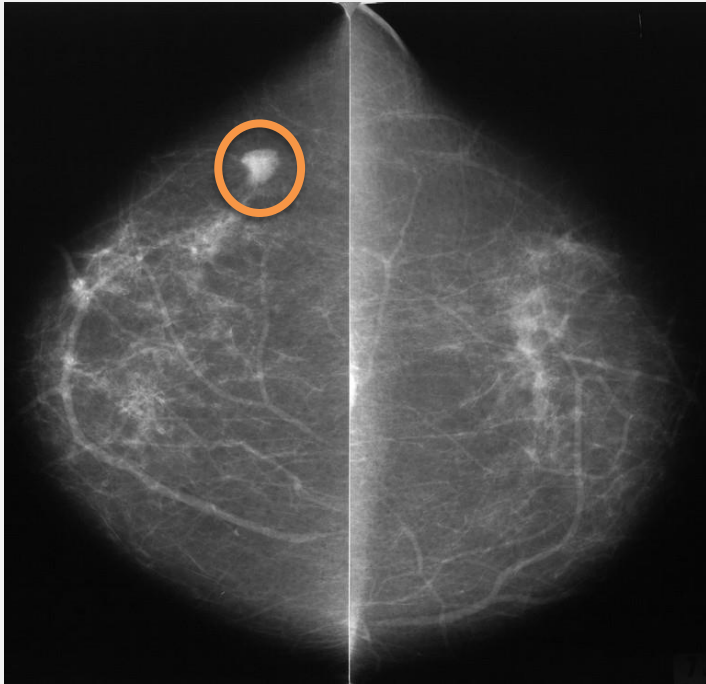
Momentos críticos de transição do cuidado



Mortalidade por Câncer: Brasil



Detecção Precoce: Prevenção Secundária



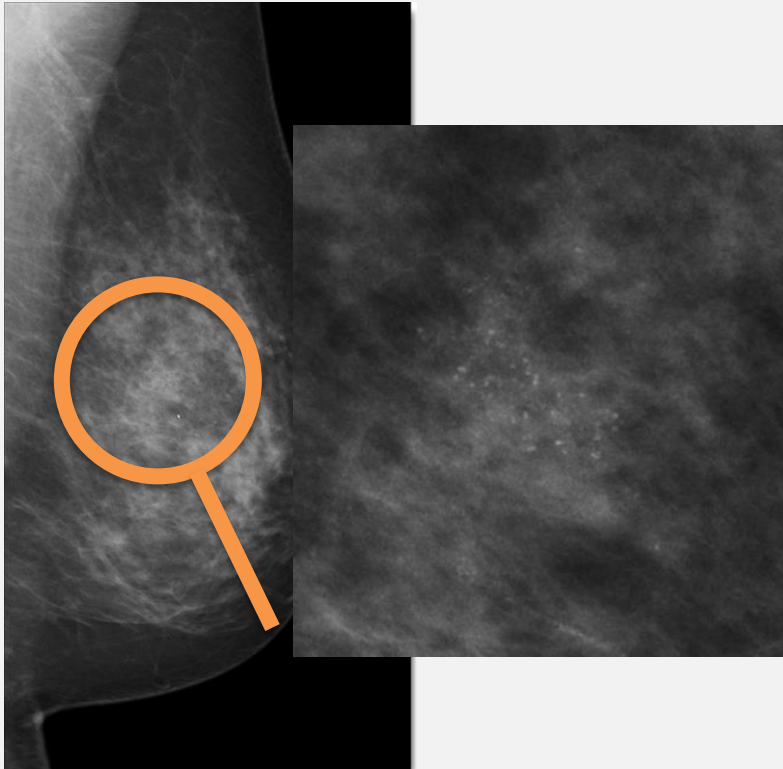
Mamografia



TC de Baixa Dose

- Carcinoma Hepatocelular, Síndromes de predisposição...

Mamografia: Interpretação

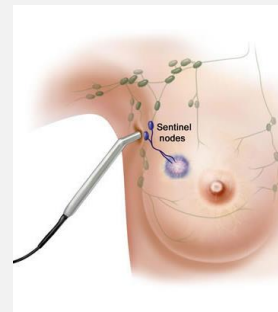
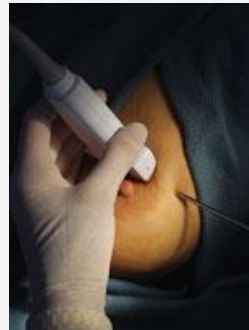
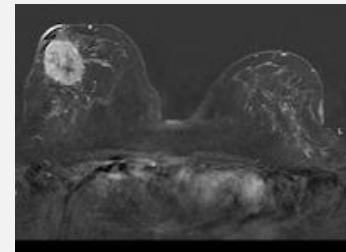
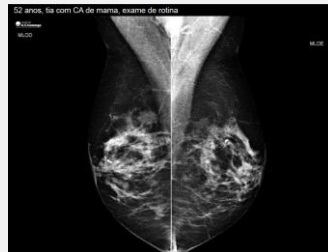


| BIRADS | Significado | Risco de câncer de mama | Conduta |
|--------|---------------------------------------|-------------------------|--|
| 0 | Exame limitado - avaliação incompleta | Não é possível estimar | Necessita de exames adicionais |
| 1 | Exame normal | Muito baixo | Controle anual |
| 2 | Alterações benignas | Muito baixo | Controle anual |
| 3 | Exame provavelmente benigno | 2% | Controle semestral por um período de tempo |
| 4 | Lesão suspeita para câncer | 20% | Necessita realização de biópsia |
| 5 | Lesão altamente suspeita para câncer | 95% | Necessita realização de biópsia |
| 6 | Lesão já com diagnóstico de câncer | 100% | Tratamento oncológico |

Accreditation/Quality



Rastreamento: Processo



Rastreamento: Auditoria

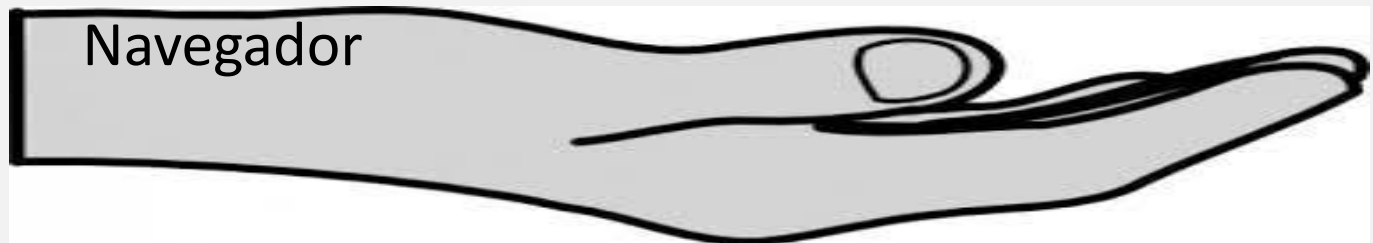
1. Total de casos de rastreamento
2. Total de casos de rastreamento, avaliação categoria BI-RADS 0 (necessita avaliação adicional por imagem) e casos de rastreamento que receberam avaliação categoria BI-RADS 4 ou 5, sem avaliação adicional
3. Total de casos de rastreamento, avaliação final categoria BI-RADS 4
4. Total de casos de rastreamento, avaliação final categoria BI-RADS 5
5. Total de casos com avaliação final categorias BI-RADS 4 e 5 que passaram por "*core biopsy*" ou punção aspirativa com agulha fina
 - 5 a. Número desses casos que eram malignos
 - 5 b. Número desses casos que eram benignos
6. Total de casos com avaliação final categorias BI-RADS 4 e 5 que passaram por biopsia cirúrgica
 - 6 a. Número desses casos que eram malignos
 - 6 b. Número desses casos que eram benignos
7. Total de casos com avaliação final Categorias BI-RADS 4 e 5 que não tiveram seguimento, tiveram biopsia recusada ou o cirurgião optou por fazer o seguimento
8. Total de cânceres classificados como Carcinoma ductal *in situ*
9. Total de cânceres classificados como Carcinoma ductal invasivo ou Carcinoma lobular invasivo
10. Total de cânceres classificados como Carcinoma ductal invasivo ou carcinoma lobular invasivo e para os quais foi realizada amostragem axilar
11. Número total de cânceres invasivos com < 1 cm
12. Número total de cânceres invasivos que mostraram linfonodos axilares negativos à cirurgia

O Modelo Ideal - a partir da Identificação dos Principais Problemas

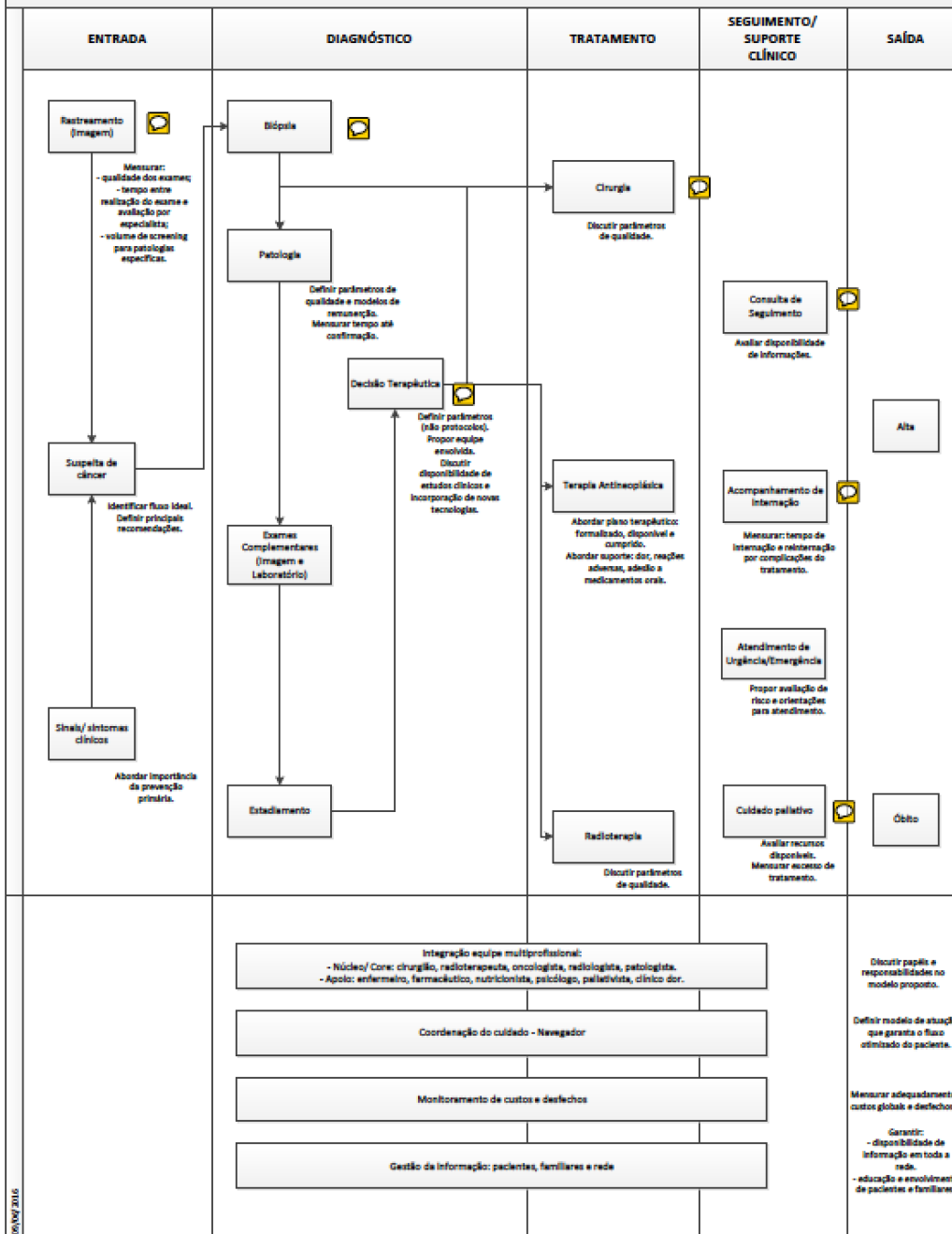
Acompanhamento Longitudinal – Trajetória do Paciente no Sistema



Momentos críticos de transição do cuidado

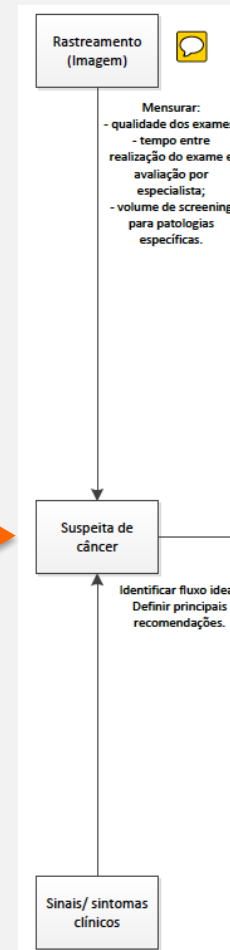


FLUXO DO PACIENTE ONCOLÓGICO VERSÃO DE TRABALHO GT ONCOLOGIA - IDENTIFICAÇÃO DE NECESSIDADES



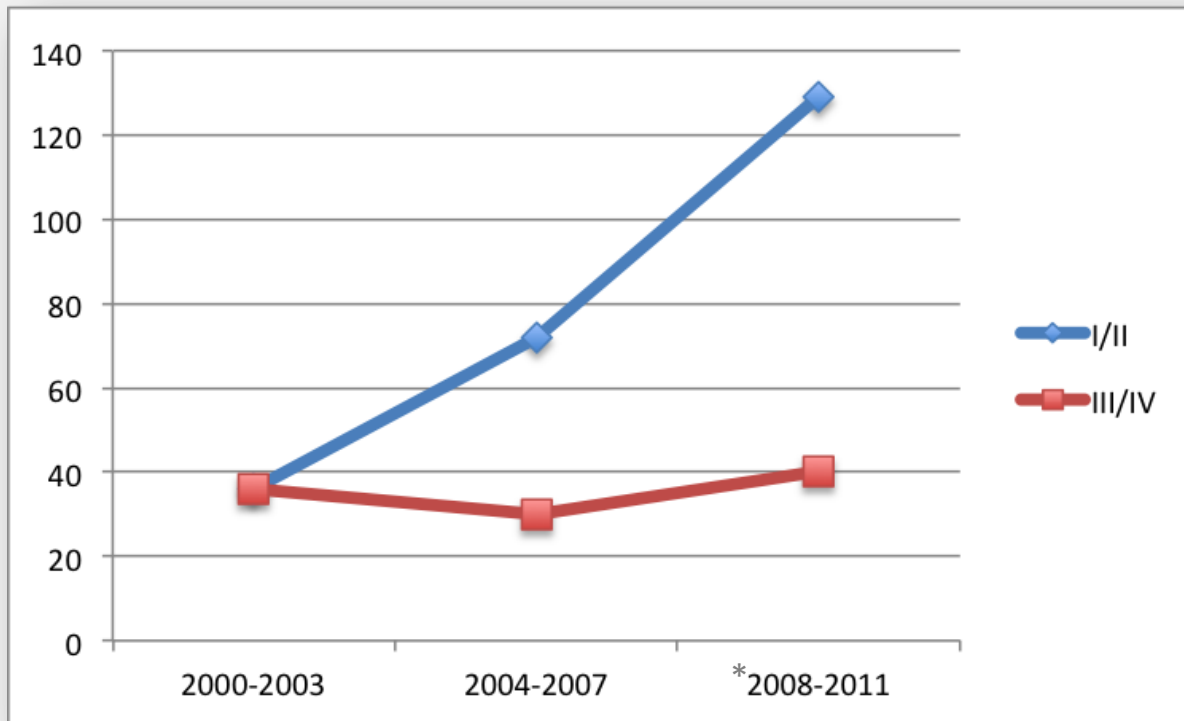
Fluxo de Entrada

- **Achados de exames: Incidentalomas**



Renal Cancer: Stage Distribution

AC Camargo, 2000-2011 (n=446)



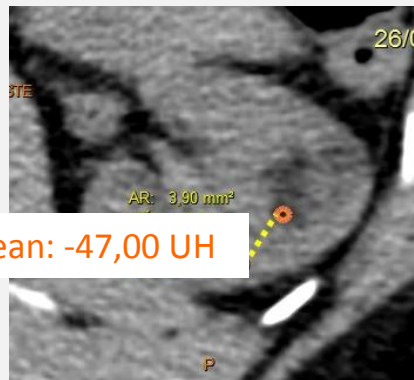
*70% incidental

Diagnóstico

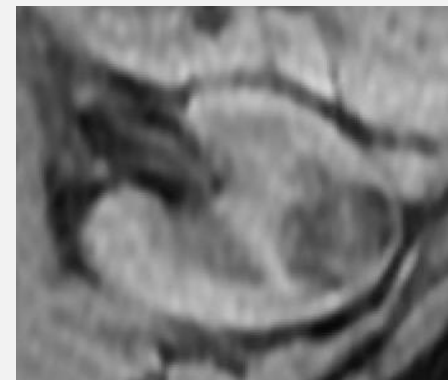
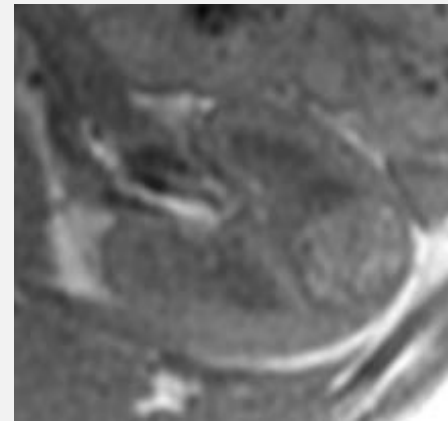
USG



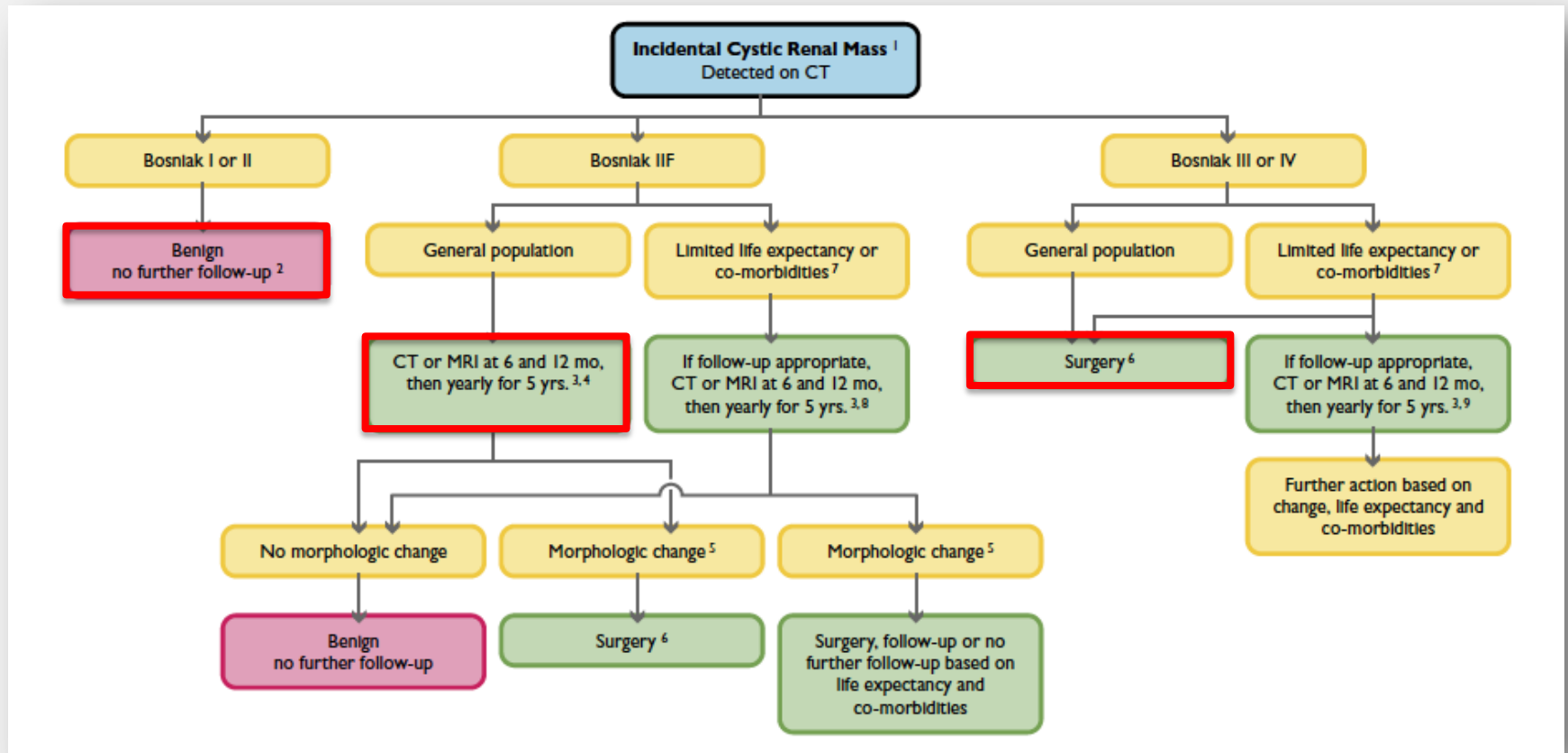
TC



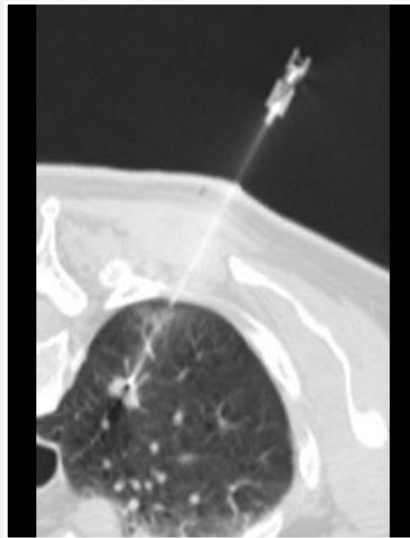
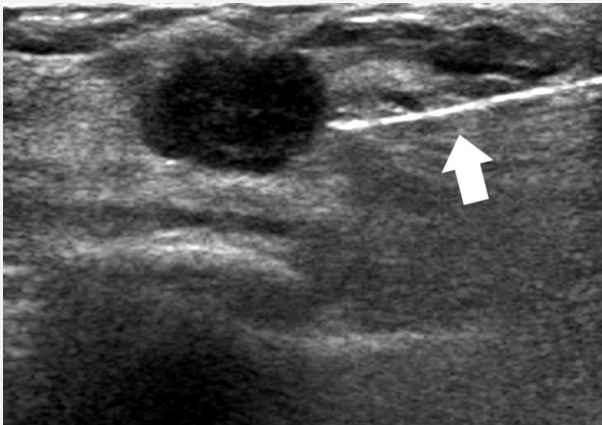
RM



Achados Radiológicos: Diretrizes de Manejo

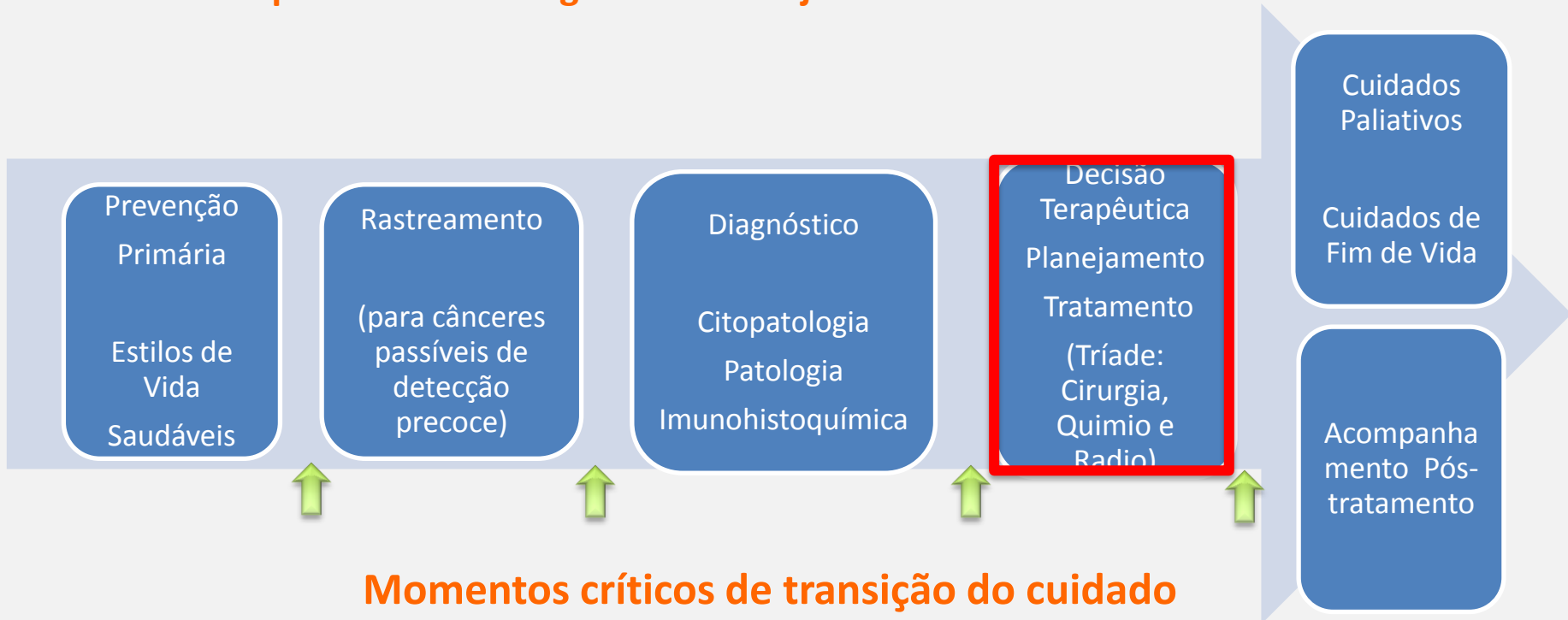


Diagnóstico

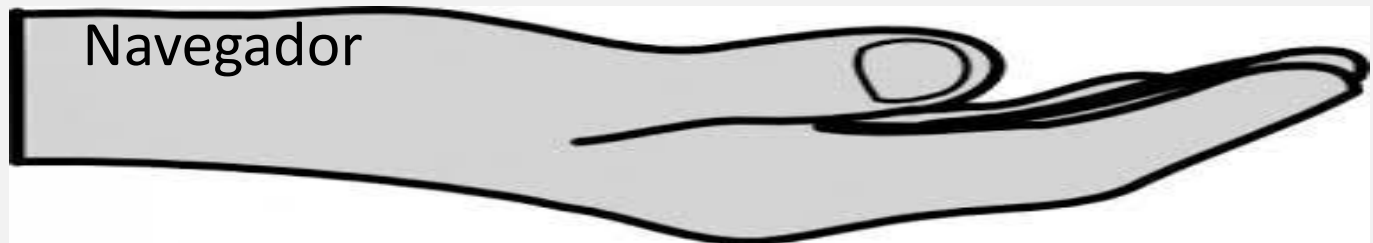


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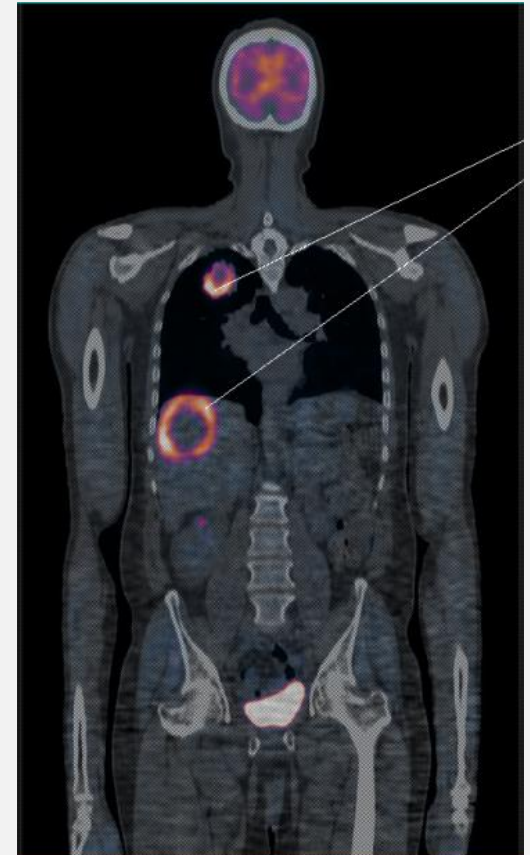
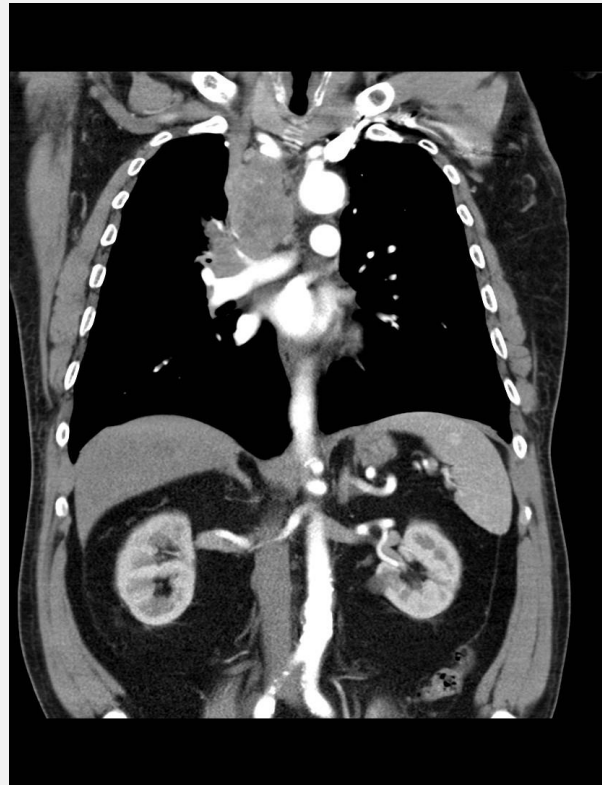
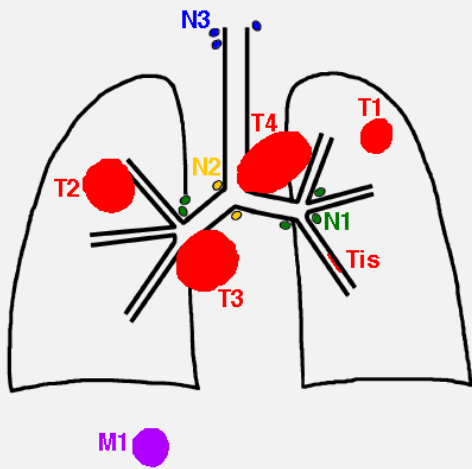
Acompanhamento Longitudinal – Trajetória do Paciente no Sistema



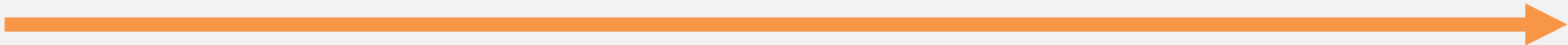
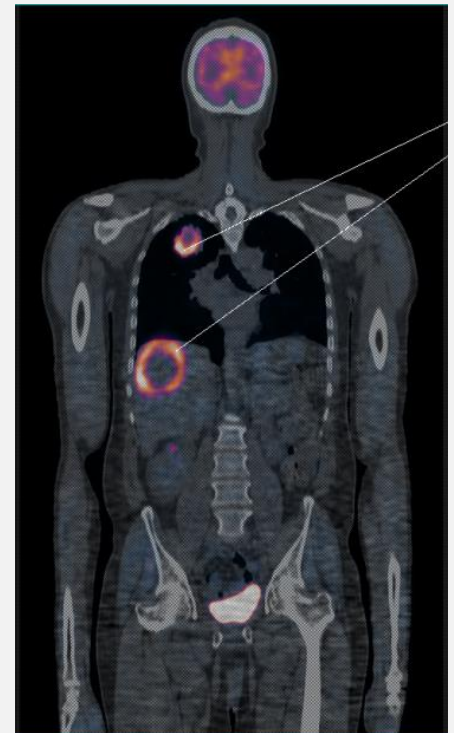
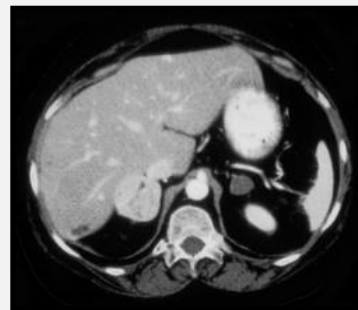
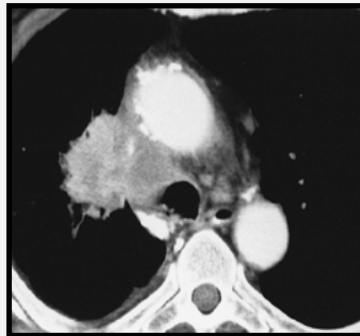
Momentos críticos de transição do cuidado



Estadramento: Cirúrgico x Clínico



Estadiamento: Decisão Terapêutica

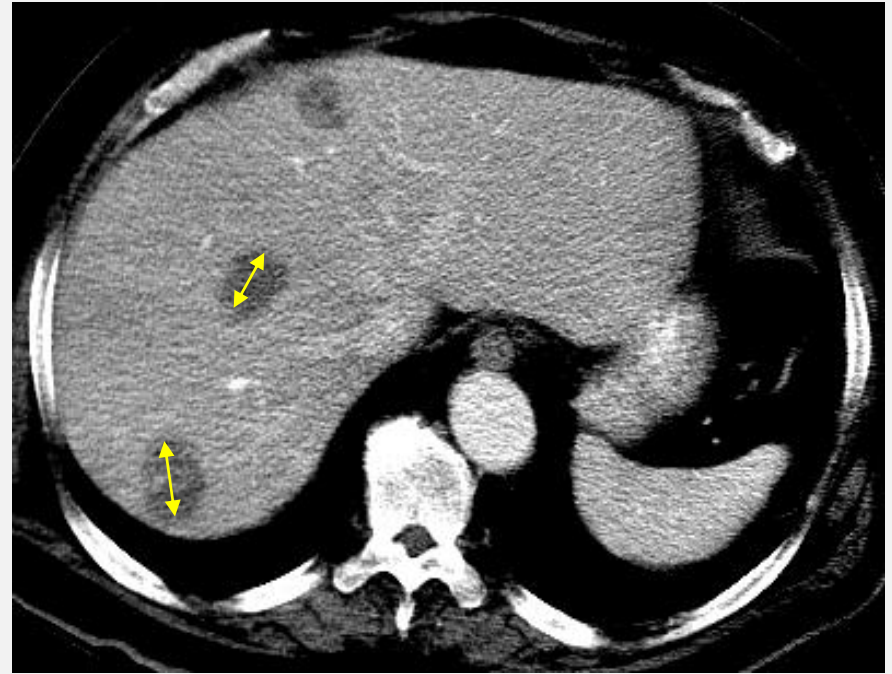
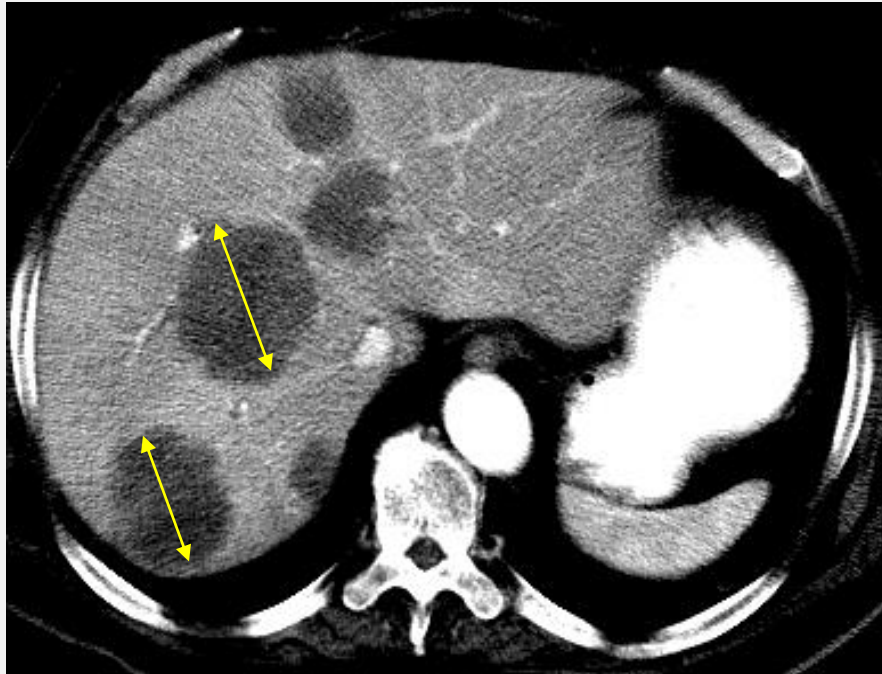


Resposta Terapêutica em Oncologia

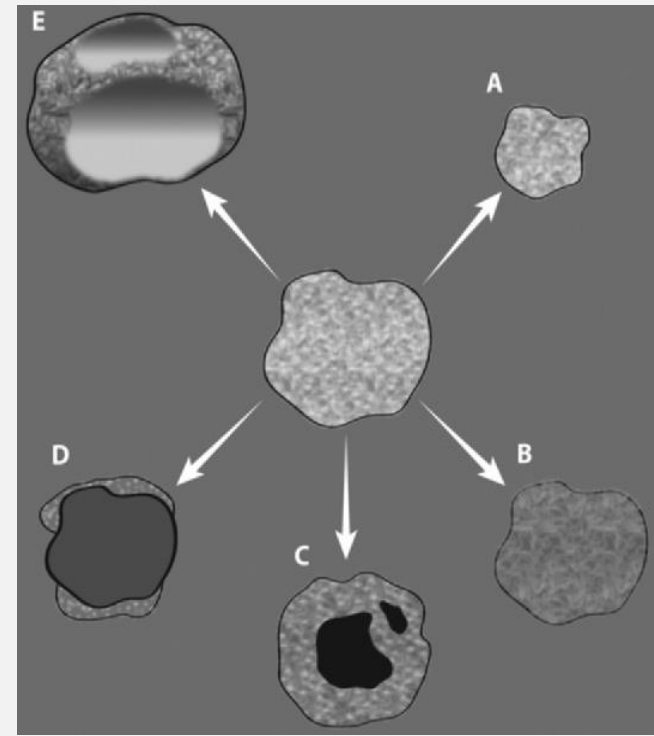
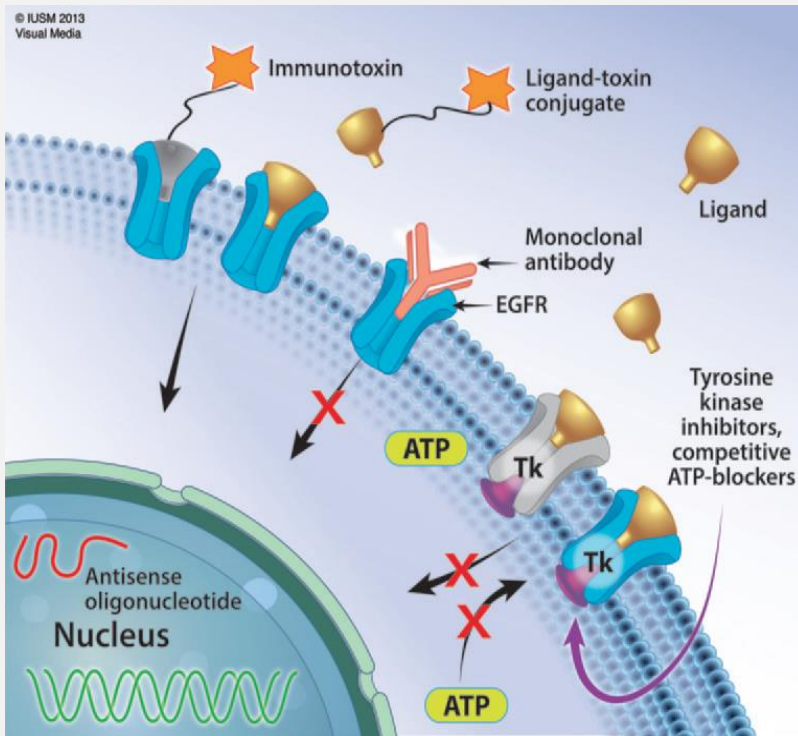
- **Clínica:**
 - **Decisão de Tratamento (Cuidado Individualizado)**
- **Pesquisa:**
 - **Avaliação Inicial de Novas Drogas (Triagem)**
 - **Estudos Fase II: Eficácia**



Imagem na Avaliação de Resposta Terapêutica



Novos Mecanismos de Ação e de Resposta



Resposta Terapêutica: GIST (Imatinib)

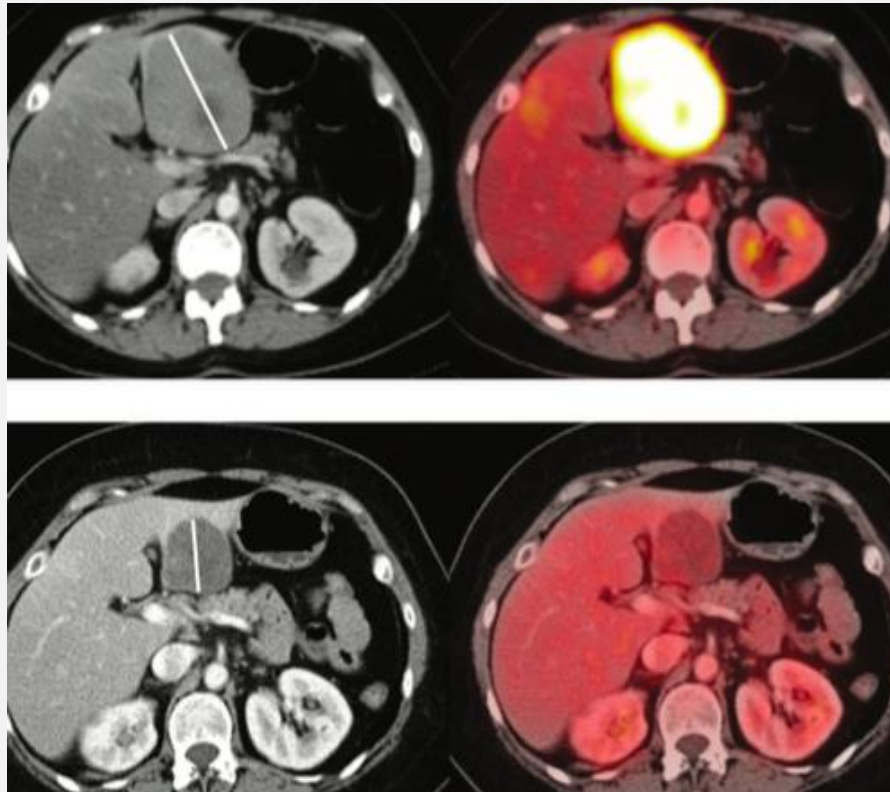


Antes



Depois

Resposta Terapêutica: Linfomas



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Acompanhamento Longitudinal – Trajetória do Paciente no Sistema



Navegador

Protocolo de seguimento: CCR

Estadio I

| | 3 | 1° e 2° anos | 9 | 12 | 3° ao 5° ano | 12 | >5anos | >10anos |
|---------------|---|--------------|---|----|--------------|----|--------|---------|
| Meses | 3 | 6 | 9 | 12 | 6 | 12 | 12 | 12 |
| Anamnese e EF | X | X | X | X | X | X | X | X |
| CEA | | X | | X | X | X | X | X |
| Colonoscopia | | | | X | | X | X | X |

5 anos

14 Consultas
10 Dosagens CEA
05 Colonoscopias

Estadio II e III

| | 3 | 1° e 2° anos | 9 | 12 | 3° ao 5° ano | 12 | >5anos | >10anos |
|-------------------|---|--------------|---|----|--------------|----|--------|---------|
| Meses | 3 | 6 | 9 | 12 | 6 | 12 | 12 | 12 |
| Anamnese e EF | X | X | X | X | X | X | X | X |
| Rx de tórax | | X | | X | X | X | X | |
| USG ou TC abdomen | | X | | X | X | X | X | |
| CEA | X | X | X | X | X | X | X | |
| Colonoscopia | | | | X | | X | X | X |

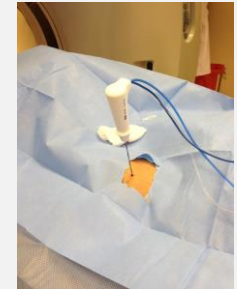
5 anos

14 Consultas
10 Rx de tórax
10 USG ou TC abdomen
14 Dosagens CEA
05 Colonoscopias

Radiologia Intervencionista

Diagnóstica

Terapêutica



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Registro Nacional de Câncer da Saúde Suplementar

Navegador

Portal Web Oncológico Integrado

Rastreamento

Suspeita Clínica

Achado Incidental

Dados Clínicos

Radiologia
Endoscopias
Laboratório
Dermatoscopia

Biópsia Guiada
por Imagem

Biópsia
Endoscópica

Biópsia Cirúrgica

Tipo do
Tumor
e
Topografia

Patologia
e
Perfil
Molecular

Diagnóstico

Estadiamento/Resposta
Terapêutica

Plano Terapêutico
Integrado

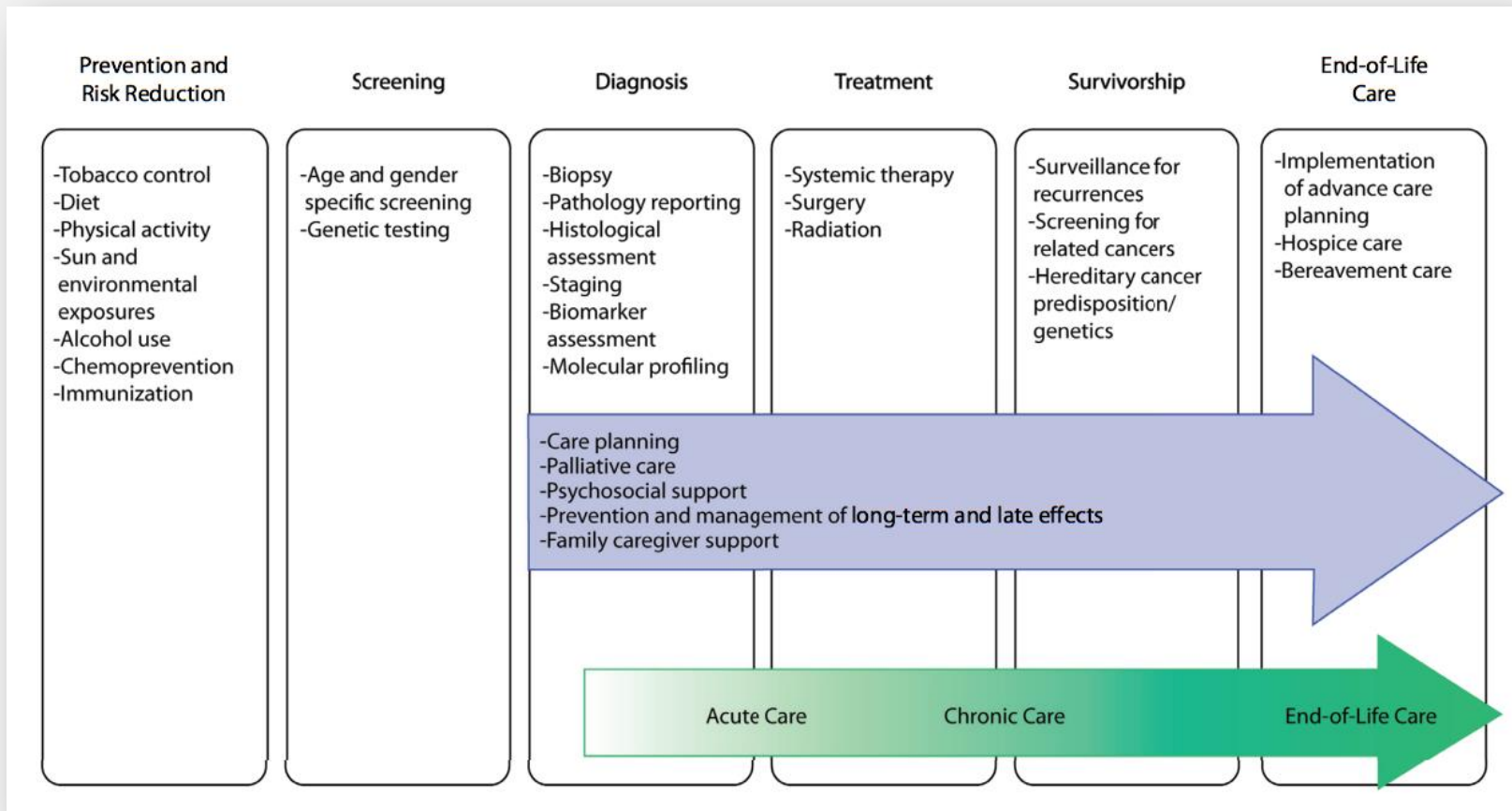
Cirurgia
Radioterapia
Quimioterapia
Outros

Tipo do Tumor
e Topografia
Estadiamento
Patologia

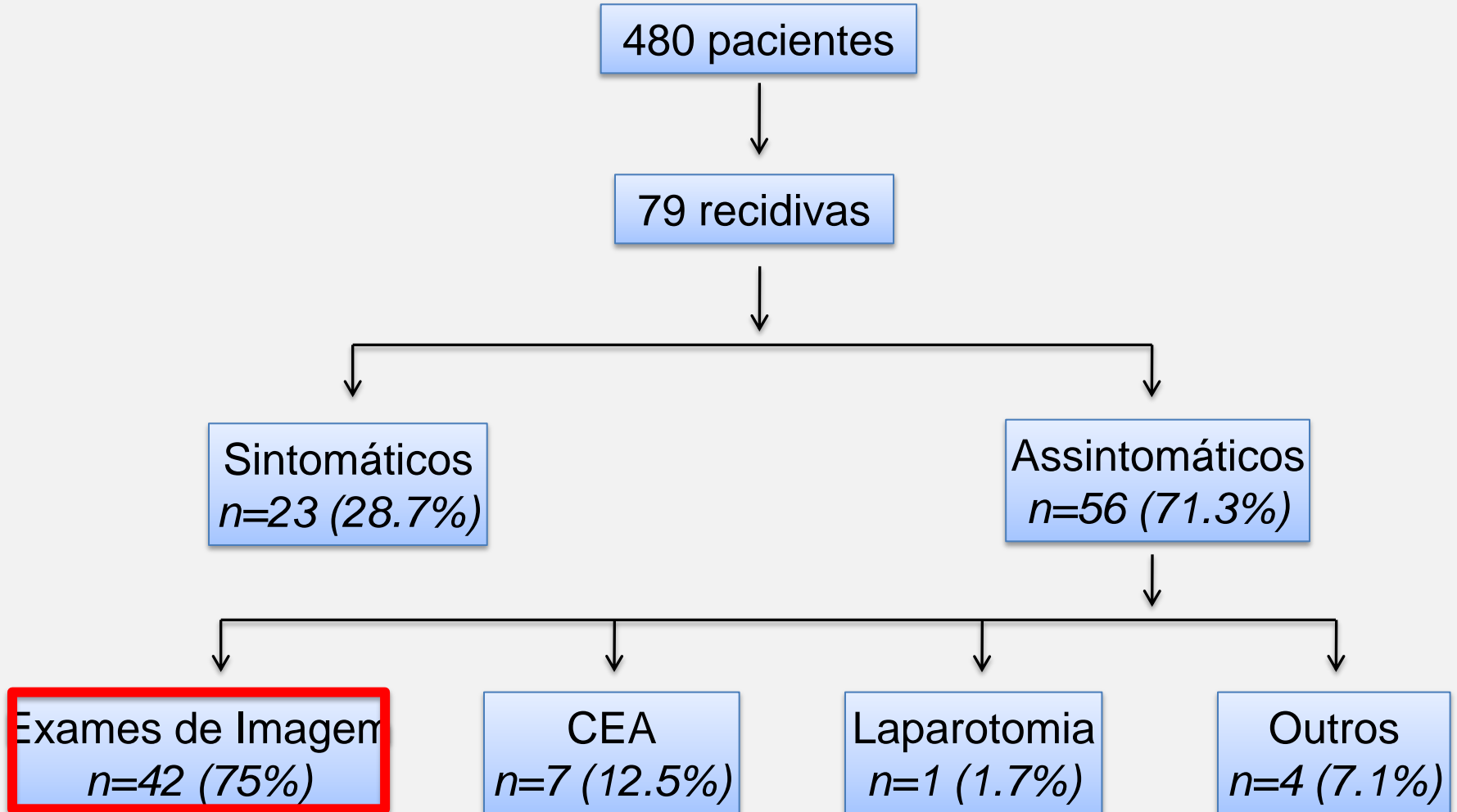
Imagem em Oncologia

- Biomarcador de presença e severidade
- Antes, durante e depois do Tratamento
- Oncologia personalizada
- Qualidade
 - Redução morbidade e mortalidade

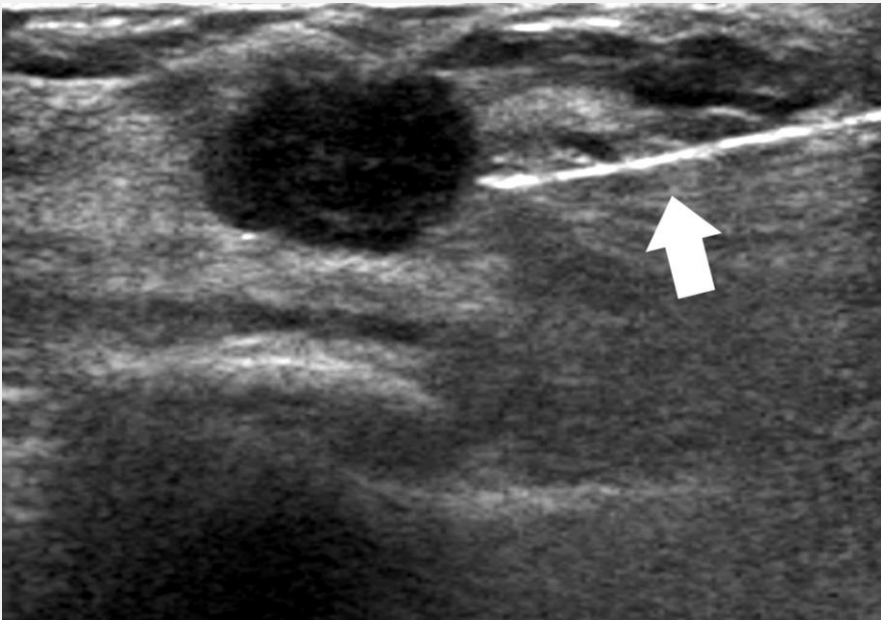
Delivering high-quality cancer care: Charting a new course for a system in crisis



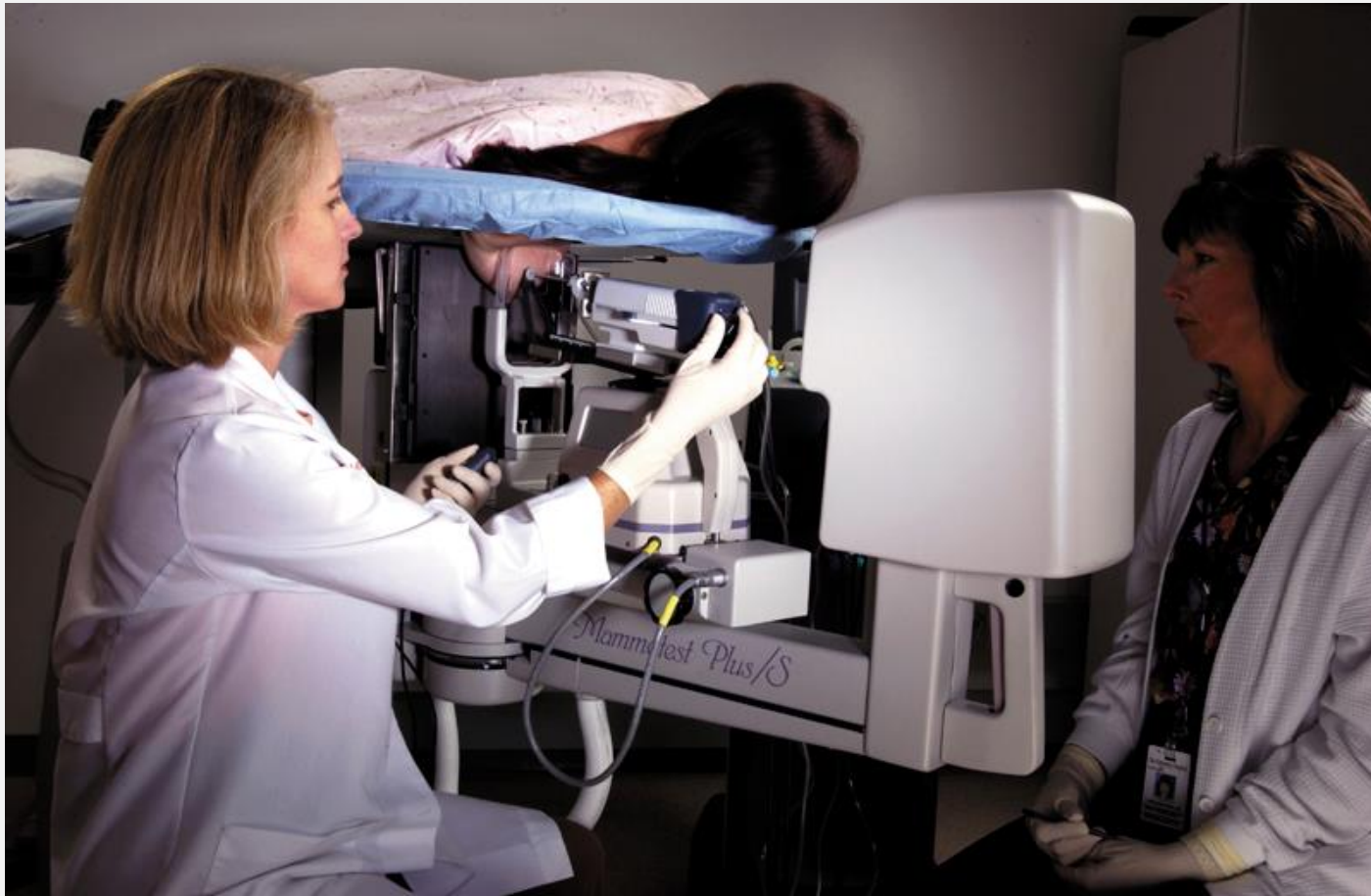
Protocolo de seguimiento: CCR



Biópsia dirigida por Ultrassom:

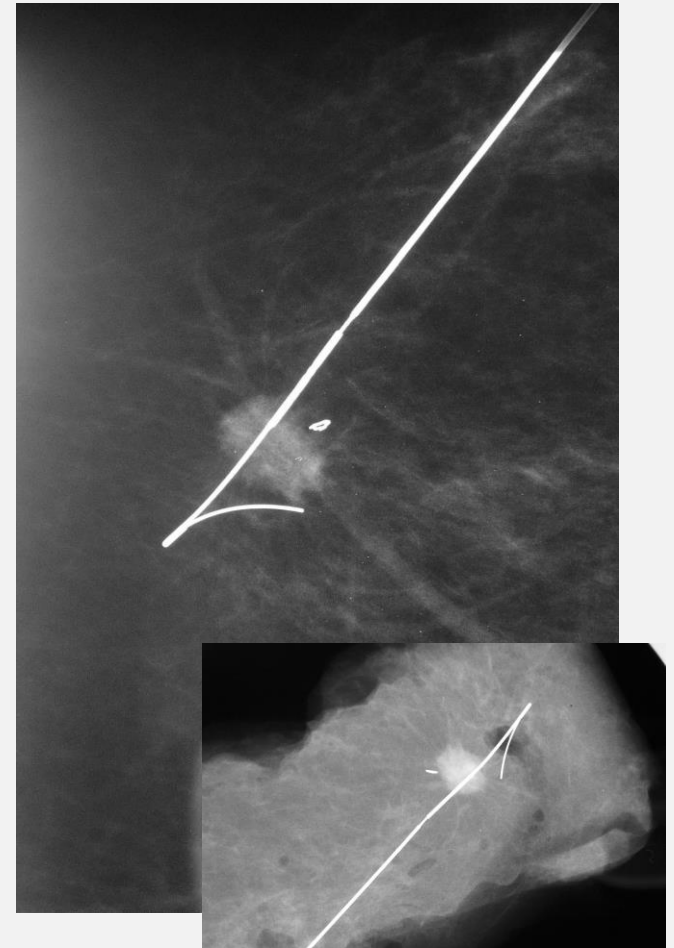
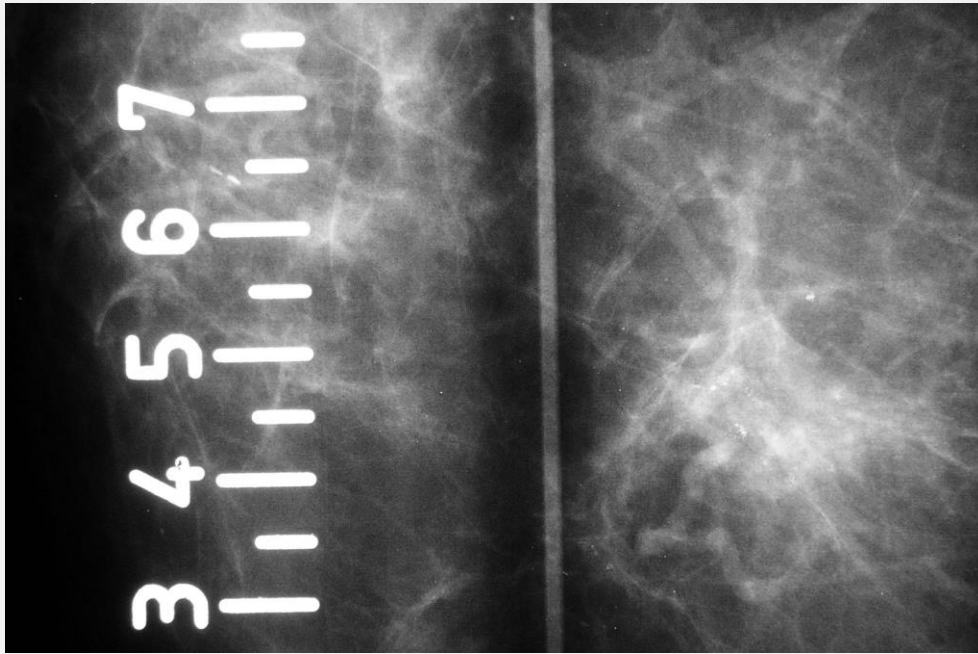


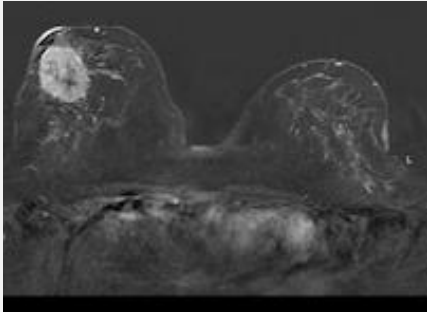
Biópsia e Localização de Lesão não palpável:



- Lesões suspeitas (Imagem e História Familiar/Pessoal)

Biópsia e Localização de Lesão não palpável:





Centers for Medicare & Medicaid Services (CMS)

- **Reading radiologist eligibility criteria:**
 - Board certification or board eligibility with the American Board of Radiology or equivalent organization;
 - Documented training in diagnostic radiology and radiation safety;
 - Involvement in the supervision and interpretation of at least 300 chest computed tomography acquisitions in the past 3 years;
 - Documented participation in continuing medical education in accordance with current American College of Radiology standards; and
 - Furnish lung cancer screening with LDCT in a radiology imaging facility that meets the radiology imaging facility eligibility criteria below.
- **Radiology imaging facility eligibility criteria:**
 - Performs LDCT with volumetric CT dose index (CTDIvol) of ≤ 3.0 mGy (milligray) for standard size patients (defined to be 5' 7" and approximately 155 pounds) with appropriate reductions in CTDIvol for smaller patients and appropriate increases in CTDIvol for larger patients;
 - Utilizes a standardized lung nodule identification, classification and reporting system;
 - Makes available smoking cessation interventions for current smokers; and
 - Collects and submits data to a CMS-approved registry for each LDCT lung cancer screening performed.

| | |
|---|--------|
| PPV ₁ based on abnormal screening examination | 5-10% |
| PPV ₂ when biopsy (surgical, FNA, or core) recommended | 25-40% |
| Tumors found - Stage 0 or 1 | >50% |
| Tumors found - Minimal cancer ¹ | >30% |
| Node positivity | <25% |
| Cancers found per 1,000 cases | 2-10 |
| Prevalent cancers found per 1,000 first-time examinations | 6-10 |
| Incident cancers found per 1,000 follow-up examinations | 2-4 |
| Recall rate | <10% |
| Sensitivity (if measurable) | >85% |
| Specificity (if measurable) | >90% |

| DATA ITEM | RESULTS |
|---|---------|
| 1. Total screening cases | |
| 2. Total screening cases, BI-RADS® assessment Category 0, (needs additional imaging evaluation) and screening cases given BI-RADS® Assessment Category 4 or 5, without further evaluation | |
| 3. Total screening cases, Final Assessment BI-RADS® Category 4 | |
| 4. Total screening cases, Final Assessment BI-RADS® Category 5 | |
| 5. Total cases from Final Assessment BI-RADS® Categories 4 and 5 that underwent core biopsy/FNA | |
| 5a. Number of these that were malignant | |
| 5b. Number of these that were benign | |
| 6. Total cases from Final Assessment BI-RADS® Categories 4 and 5 that underwent surgical biopsy | |
| 6a. Number of these that were malignant | |
| 6b. Number of these that were benign | |
| 7. Total cases from Final Assessment BI-RADS® Categories 4 and 5 that were lost to follow-up, refused biopsy, or surgeon elected to follow rather than biopsy | |
| 8. Total cancers found that were ductal carcinoma in situ | |
| 9. Total cancers found that were invasive ductal carcinoma or invasive lobular carcinoma | |
| 10. Total cancers found that were invasive ductal carcinoma or invasive lobular carcinoma for which axillary sampling was performed | |
| 11. Total number of invasive cancers that were ≤1 cm in size | |
| 12. Total number of invasive cancers that showed negative axillary lymph nodes at surgery | |

2015 audit radiology KPIs

- R1a Non-operative staging of the axilla:** units with 15% or more invasive cancers without pre-operative axillary ultrasound recorded
- R1b Non-operative staging of the axilla:** units with 15% or more invasive cancers with an abnormal axillary ultrasound without a needle biopsy recorded
- R2 Repeat visits to obtain a non-operative diagnosis:** units where more than 20% of women have more than one assessment clinic visit
- R3 Non-operative diagnosis for non-invasive cancers:** 1-year low outlier units for non-operative diagnosis of non-invasive cancers (excluding LCIS)

2015 audit pathology KPIs

- P1 Invasive cancers with positive ER status:** 3-year 99.7% high and low outlier units for positive invasive cancer ER status
- P2 Invasive cancers with positive HER status:** 3-year 99.7% high and low outlier units for positive invasive cancer HER2 status
- P3 Invasive cancer grade:** 3-year 99.7% high and low outlier units for invasive cancer grade

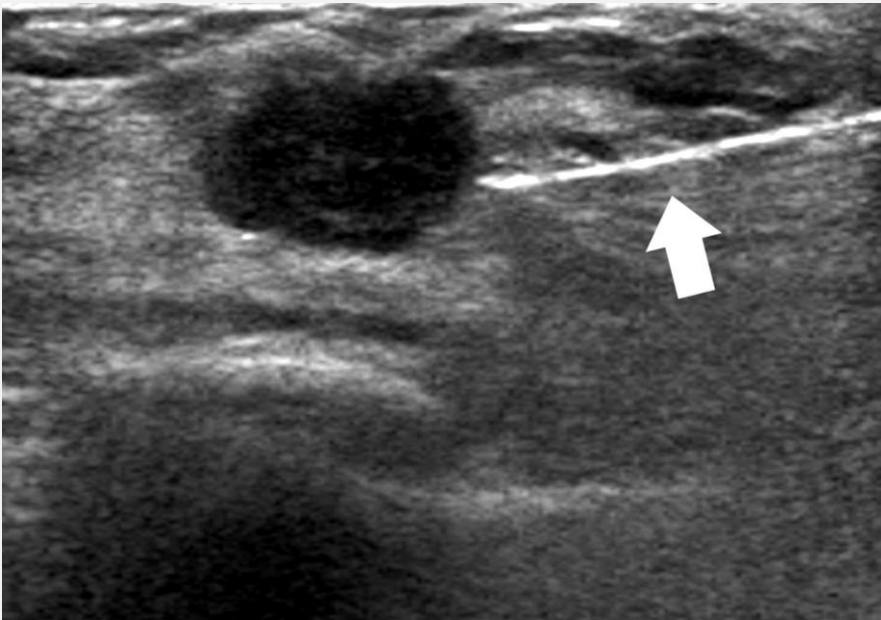
2015 audit surgery KPIs

- S1a Repeat operations for involved margins:** Units with less than 80% of invasive cancers with an involved closest radial margin after breast conserving surgery with a repeat operation to the breast
- S1b Repeat operations for close margins:** Units with more than 5% of invasive cancers with a closest radial margin greater than 5mm after breast conserving surgery with a repeat operation to the breast
- S2a Surgical examination of axillary lymph nodes:** 1-year high outlier units with more than 5 nodes obtained from node negative invasive cancers (excluding cases with neo-adjuvant therapy)
- S2b Surgical examination of axillary lymph nodes:** 1-year high outlier units for axillary node surgery performed on non-invasive cancers treated with breast conserving surgery
- S3a Mastectomy for non-invasive cancers:** 1-year high outlier units for mastectomy rates for non-invasive cancers
- S3b Immediate reconstruction for non-invasive cancers:** 1-year low outlier units for immediate reconstruction for non-invasive cancers

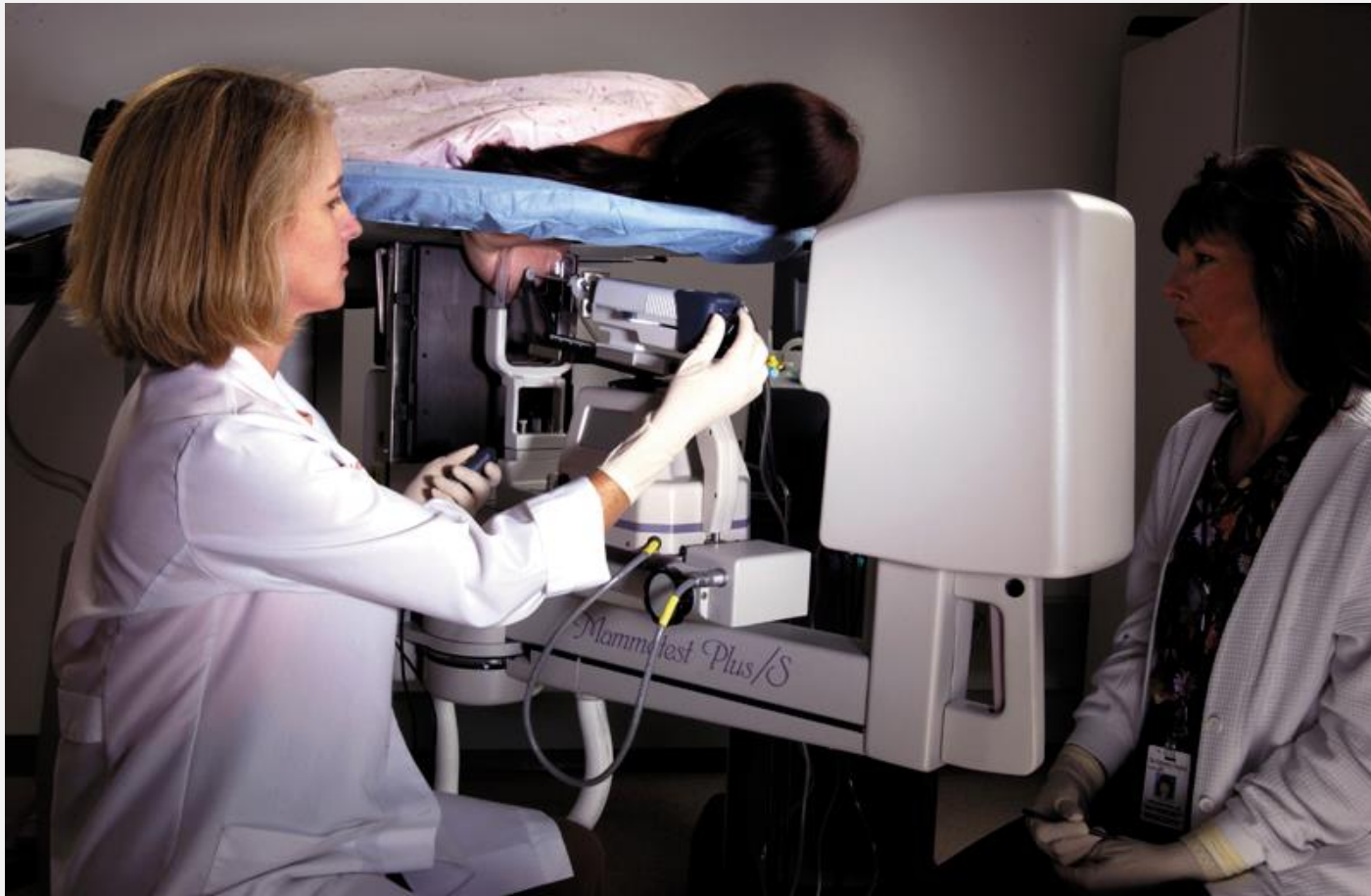
2015 audit oncology KPIs

- O1 Radiotherapy after breast conserving surgery:** 1-year high outlier units for invasive cancers treated with breast conserving surgery with no or unknown adjuvant radiotherapy
- O2 Endocrine therapy for ER positive invasive cancers:** 1-year high outlier units for ER positive invasive cancers with NPI >3.4 with no or unknown adjuvant endocrine therapy
- O3 Chemotherapy for node positive invasive cancers:** 1-year high outlier units for node positive (with macro-metastases) invasive cancers which are Grade 3 and/or ER negative and/or HER2 positive with no or unknown adjuvant chemotherapy

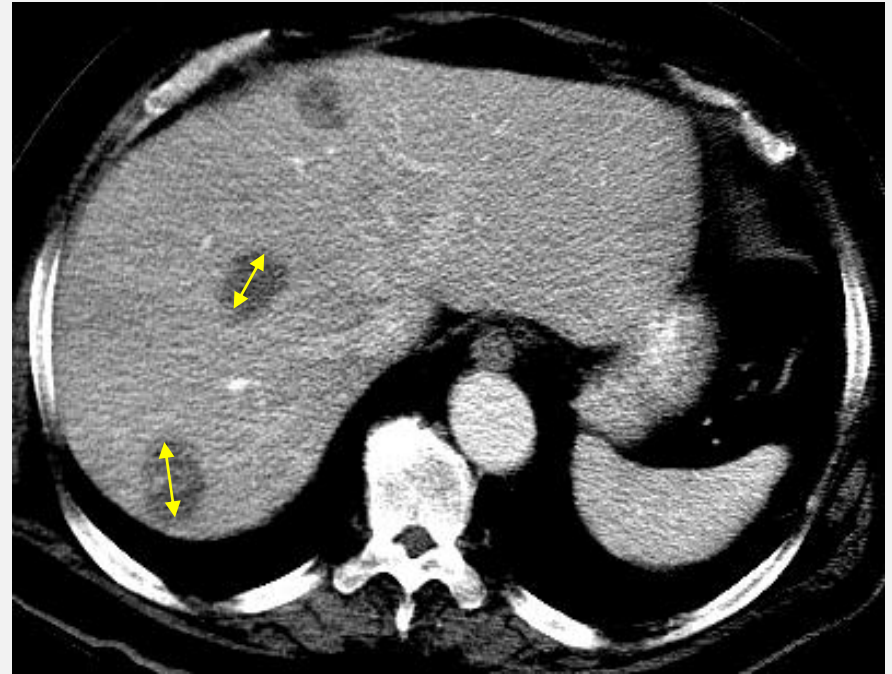
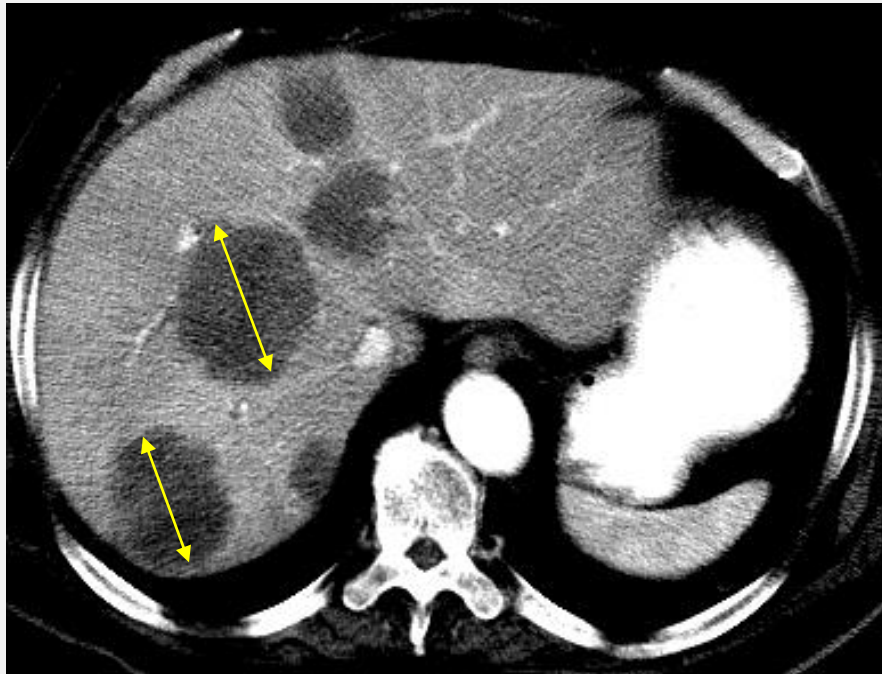
Biópsia dirigida por Ultrassom



Biópsia e Localização de Lesão não palpável: Mamografia



Resposta Terapêutica



Diagnóstico por Imagem

- Anatomia Seccional / Computação Gráfica
- Anatomia, Fisiologia, Metabolismo
 - Ferramentas
- Diversas etapas da avaliação oncológica:
 - Antes, durante e depois do diagnóstico/tratamento
- Tratamento Individualizado
- Impacto Saúde:
 - Mortalidade, Morbidade

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