American College of Radiology  
ACR Appropriateness Criteria®

Radiologic Management of Biliary Obstruction

Variant 1:  Initial therapeutic procedure for a patient with dilated bile ducts from choledocholithiasis.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Moderate</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7 (21872710)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10 (8813987)</td>
</tr>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23 (3566375)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 (12204406)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25 (21638145)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26 (11577321)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27 (23782350)</td>
</tr>
<tr>
<td>Surgery</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25 (21638145)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28 (23999986)</td>
</tr>
<tr>
<td>Medical management only</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>
### Permanent biliary metallic stent

<table>
<thead>
<tr>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 7 (21872710) 11 (21684464)

### Removable biliary covered stent

<table>
<thead>
<tr>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>May be appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

### Endoscopic US-guided biliary drainage (EUS-BD)

<table>
<thead>
<tr>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 12 (26020052)

### Variant 2: Initial therapeutic procedure for a patient with elevated bilirubin and suspected sclerosing cholangitis.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 35 (21241424) 38 (3584158) 39 (10483999)

### Percutaneous internal/external biliary catheter

<table>
<thead>
<tr>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 35 (21241424) 37 (3876737)

### Surgery

<table>
<thead>
<tr>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usually not appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References:
### Variant 3: Initial therapeutic procedure for a liver transplant recipient with elevated bilirubin and suspected biliary anastomotic stenosis or bile leak, with no dilated ducts.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0  0  0  0  0  0  0  0  0  0</td>
</tr>
</tbody>
</table>

References: 48 (16116539), 49 (21280189), 50 (18702031), 51 (29026597)
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness</th>
<th>Limited</th>
<th>N/A</th>
<th>n/a</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>Usually appropriate</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
</tr>
<tr>
<td>References</td>
<td>Study Quality</td>
<td>46 (26689137)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>49 (21280189)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>56 (23432435)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td>Usually not appropriate</td>
<td>N/A</td>
<td>N/A</td>
<td>3</td>
<td>n/a</td>
</tr>
<tr>
<td>References</td>
<td>Study Quality</td>
<td>46 (26689137)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>58 (11907771)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>59 (2799642)</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical management only</td>
<td>Usually not appropriate</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
</tr>
<tr>
<td>References</td>
<td>Study Quality</td>
<td>46 (26689137)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent biliary metallic stent</td>
<td>Usually not appropriate</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>References</td>
<td>Study Quality</td>
<td>52 (24587819)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removable biliary covered stent</td>
<td>May be appropriate</td>
<td>N/A</td>
<td>N/A</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Endoscopic US-guided biliary drainage (EUS-BD)</td>
<td>Usually not appropriate</td>
<td>N/A</td>
<td>N/A</td>
<td>3</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Variant 4: Initial therapeutic procedure for a patient with bile leak and dilated bile ducts following laparoscopic cholecystectomy.
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>61 (23322833)</td>
</tr>
<tr>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>62 (20575884)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66 (19220666)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67 (24954866)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>61 (23322833)</td>
</tr>
<tr>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>68 (14759778)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>69 (18922456)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Surgery</td>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67 (24954866)</td>
</tr>
<tr>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>68 (14759778)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>69 (18922456)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Medical management only</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67 (24954866)</td>
</tr>
<tr>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Permanad biliary metallic stent</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67 (24954866)</td>
</tr>
<tr>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Removable biliary covered stent</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>71 (24661988)</td>
</tr>
<tr>
<td>Study Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
### Variant 5: Initial therapeutic procedure for a patient with dilated bile ducts and suspected biliary sepsis or acute cholangitis.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic US-guided biliary drainage (EUS-BD)</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Surgery</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Medical management only</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Permanent biliary metallic stent</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References

<table>
<thead>
<tr>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>79 (1371206)</td>
</tr>
<tr>
<td>80 (9336514)</td>
</tr>
<tr>
<td>81 (28834389)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>79 (1371206)</td>
</tr>
<tr>
<td>80 (9336514)</td>
</tr>
<tr>
<td>81 (28834389)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>79 (1371206)</td>
</tr>
<tr>
<td>80 (9336514)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>79 (1371206)</td>
</tr>
<tr>
<td>80 (9336514)</td>
</tr>
<tr>
<td>81 (28834389)</td>
</tr>
<tr>
<td>Procedure</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Removable biliary covered stent</td>
</tr>
<tr>
<td>Endoscopic US-guided biliary drainage (EUS-BD)</td>
</tr>
</tbody>
</table>

References: 88 (27122677)

Variant 6: Initial therapeutic procedure for a patient with malignant common bile duct obstruction (eg, pancreatic carcinoma).

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 95 (26290631), 96 (22415652)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>Usually appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>7</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 109 (25148939), 110 (19609609), 111 (24064748), 112 (12354980)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>May be appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>5</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

References: 113 (21068488), 114 (19606687), 115 (-3138827), 116 (16632990)
<table>
<thead>
<tr>
<th>Medical management only</th>
<th>Usually not appropriate</th>
<th>Limited</th>
<th>N/A</th>
<th>N/A</th>
<th>3</th>
<th>n/a</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>89 (26322156)</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percutaneous biliary metallic stent</th>
<th>May be appropriate</th>
<th>Strong</th>
<th>N/A</th>
<th>N/A</th>
<th>5</th>
<th>n/a</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 (26911896)</td>
<td>4</td>
</tr>
<tr>
<td>95 (26290631)</td>
<td>4</td>
</tr>
<tr>
<td>96 (22415652)</td>
<td>1</td>
</tr>
<tr>
<td>97 (16650542)</td>
<td>4</td>
</tr>
<tr>
<td>98 (20467870)</td>
<td>1</td>
</tr>
<tr>
<td>99 (21034892)</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Removable biliary covered stent</th>
<th>May be appropriate</th>
<th>Strong</th>
<th>N/A</th>
<th>N/A</th>
<th>5</th>
<th>n/a</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 (26911896)</td>
<td>4</td>
</tr>
<tr>
<td>98 (20467870)</td>
<td>1</td>
</tr>
<tr>
<td>99 (21034892)</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endoscopic US-guided biliary drainage (EUS-BD)</th>
<th>May be appropriate</th>
<th>Strong</th>
<th>N/A</th>
<th>N/A</th>
<th>4</th>
<th>n/a</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>References</th>
<th>Study Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>104 (21963067)</td>
<td>3</td>
</tr>
<tr>
<td>105 (23523301)</td>
<td>2</td>
</tr>
<tr>
<td>106 (23021167)</td>
<td>3</td>
</tr>
<tr>
<td>107 (22810111)</td>
<td>1</td>
</tr>
</tbody>
</table>

**Variant 7:** Initial therapeutic procedure for a patient with hilar biliary obstruction from malignant etiology (eg, Klatskin tumor).
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>May be appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118 (15922889)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119 (19756881)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 (18585976)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>121 (18657806)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>122 (16437689)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>Usually appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118 (15922889)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119 (19756881)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 (18585976)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>121 (18657806)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>122 (16437689)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td>May be appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>5</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Medical management only</td>
<td>Usually not appropriate</td>
<td>Strong</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>117 (17461441)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118 (15922889)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119 (19756881)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent biliary metallic stent</td>
<td>May be appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Removable biliary covered stent</td>
<td>May be appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>5</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Endoscopic US-guided biliary drainage (EUS-BD)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>3</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>123 (25024600) 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>124 (25264761) 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>125 (23711555) 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>126 (26379410) 4</td>
</tr>
</tbody>
</table>

### Variant 8: Initial therapeutic procedure for a patient with dilated bile ducts and coagulopathy (INR >2.0 or platelet count <60 K).

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>81 (28834389) 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>128 (18042116) 4</td>
</tr>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>81 (28834389) 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>129 (20307987) 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>130 (22864606) 3</td>
</tr>
</tbody>
</table>

### Medical management only

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Medical management only</td>
<td>May be appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Permanent biliary metallic stent</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>
## Variant 9: Initial therapeutic procedure for a patient with dilated bile ducts and moderate to massive ascites.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic internal biliary catheter (removable plastic stent)</td>
<td>Usually appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>8</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>133 (22464717)</td>
</tr>
<tr>
<td>Percutaneous internal/external biliary catheter</td>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>5</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>133 (22464717)</td>
</tr>
<tr>
<td>Surgery</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>131 (6606961)</td>
</tr>
<tr>
<td>Medical management only</td>
<td>May be appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>132 (24433643)</td>
</tr>
<tr>
<td>Permanent biliary metallic stent</td>
<td>Usually not appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>133 (22464717)</td>
</tr>
<tr>
<td>Removable biliary covered stent</td>
<td>May be appropriate</td>
<td>Expert Consensus</td>
<td>N/A</td>
<td>N/A</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>133 (22464717)</td>
</tr>
<tr>
<td>Endoscopic US-guided biliary drainage (EUS-BD)</td>
<td>Usually not appropriate</td>
<td>Limited</td>
<td>N/A</td>
<td>N/A</td>
<td>3</td>
<td>n/a</td>
<td>0</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

References | Study Quality |
---|---|
134 (26811666) | 4 |
135 (27129552) | 2 |
Appendix Key
A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

**Appropriateness Category**: The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

**SOE**: Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References**: The citation number and PMID for the reference(s) associated with the recommendation.
- **Study Quality**: The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

**RRL**: Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

**Rating**: The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

**Median**: The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

**Final tabulations**: A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at [www.acr.org/ac](http://www.acr.org/ac).